"Teaching with the interactive whiteboard – How to enhance teaching vocabulary to primary children aged 8 and 9"

Submitted by

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I certify that all material in this thesis which is not my own work has been identified and that no material has previously been submitted and approved for the award of a degree by this or any other University.

Signature: …….

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DEDICATION

To my Mum . . . Nothing is the same since you passed away

To my sister Nawal and my Brother Hafaz....with your support and your kids' laughter I manage to go on

To My nephew Ahmed and niece Khloud who never stopped encouraging me

To my dearest friends Dalal and Zainab ...Thank you for being great sisters

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Abstract

The integration of information technology (ICT) into primary classrooms is increasingly crucial for engaging and stimulating digital young learners who are in daily contact with technology. In 2005 Bahrain Ministry of Education started King Hamad Future Schools Project which aimed to adopt the interactive whiteboard (IWB) in all government schools. However, there has not yet been any study that investigates the utilization of this technology in English language teaching either in primary or in intermediate and secondary schools. This thesis studies the employment and effectiveness of IWB in teaching English vocabulary to 104 young learners and their attitude and perception towards its use in their learning. Both qualitative and quantitative data were collected, through questionnaire, language tests and classroom observations. The questionnaire and the observation results indicated that IWB is highly rated and preferred by the participating young learners. Three themes emerged from observation. The first theme is the IWB impact on children as learners which entails its influence on the children's interaction, their learning, and their behaviour; the second theme is the impact of IWB on pedagogy; this involves the use of IWB multimedia, its presentational mode of range, and the use of games. The third and final theme is the IWB's interactional affordances that include the teachers and the pupils' use and control of the interactive board and the IWB's effects on the lesson's space. The analysis of the vocabulary tests has shown a positive impact on the learning of English vocabulary which was reflected by the pupils' test results. As the study was conducted in Bahrain and on limited number of young learners, its results are limited and cannot be generalised.

INTRODUCTION

Introduction

Many teachers, researchers, and educators view the use of information and communication technology (ICT) as the turning point in the teaching and the learning process. This attitude originates from the belief that ICT can play a large role in enhancing the teaching and the learning process which was reinforced by various studies such as Moseley et al. (1999) which investigated the ICT's role in providing teachers with different tools that enable them to choose the teaching technique that suits the pupils' interests and levels. A more greater role for the technologies was suggested by Tinio (2002) who stated that in developing countries different technologies such as computers and internet —"have been touted as potentially powerful enabling tools for educational change and reform" (p. 3). Such tools can alter information and present it in different forms such as text, picture or graph that would be easier for pupils to understand (Higgins, 2003, p. 12). ICT can also create a forum for discussions or debate which may also assist the pupils' understanding (ibid). A year later, this was confirmed by Becta's (2004) report which confirmed the ICT impact on pupils' attainment especially in English, math, science and ICT.

Despite all this, Higgins (2003) argued that such impact is debatable as there are many factors may affect the utilization of ICT in teaching. One of the main factors is the teachers' belief and experience which according to Higgins is a difficult task (Higgins et al., 2001, pp. 204&205). Poole (1995) agreed with Higgins and argued that making the transition from traditional teaching to a teaching in which teachers use technology is not

a simple matter as it is a transition in culture, in “teaching paradigms” , and in “way of thinking” (p. 198).

Teachers’ lack of confidence can also affect the integration of ICT with pedagogy. Studies which investigated and highlighted this factor argued that this feeling arises from the teachers’ “fear of failure” (Beggs, 2000, p.3). However, other researchers asserted that “many teachers who do not consider themselves to be well skilled in using ICT feel anxious about using it in front of a class of children who perhaps know more than they do” (Becta, 2004, p.7).

Besides the above factors, Bingimlas (2009) ‘identified lack of time’, ‘lack of training’, and ‘lack of technical support’ (pp. 239 & 241) as other major factors that affect the application of ICT in pedagogy. Despite all these factors, most researchers endorse applying ICT in education and encourage teachers to overcome these obstacles. This attitude ascends from the belief that for teaching to attract and please the pupils, its methodology must be parallel with all the technologies and changes in the world. Pupils these days are connected with technology and know all the latest gadgets thus will not be interested in the conventional way of teaching therefore it is essential that schools must be equipped with the latest educational gadgets that would meet the expectation of the pupils and teachers. One of the latest gadgets that seem to transfer the teaching and learning experience and satisfy both the teachers and pupils is the interactive whiteboard (IWB hereafter).

This tool when it was first developed was not intended to be used in education. It is only since the late 1990s that educators started using it as an instructional tool in classrooms. The IWB is mainly a large board similar to the conventional whiteboard but

connected to a computer and a projector. When a teacher connects it to a computer, the board is transferred to a touch-sensitive screen that controls the computer. The IWB screen itself can be managed by a pen that comes with the device; there are however some kinds of IWB which can be managed by a finger. Having it connected to a computer means that any program or documents on the computer can be accessed and displayed on the IWB. IWB comes also with special software which enables teachers to interact with images and text and resized, colour or rearranged them; this offers pupils of all ages a much more interactive experience than using a conventional whiteboard. Dudeney (2006) stated that the main difference between using a computer with a projector and using IWB technology is that ‘‘IWBs make the computer invisible, as all interaction with both the hardware and the software takes place within the familiar confines of the board itself” (p. 27). IWBs also provide teachers with the ability to save any documents to the computer and teachers then can print them to the pupils or to present them as a record for the absent pupils (Miller et al., 2002).

Realizing the powerful effects that IWBs may have on teaching and learning, in 2004 the Ministry Education in Bahrain launched King Hamad Future Schools Project and allocated a huge budget to transfer all schools classrooms to places where pupils find learning fun and compatible with the technological world which they live in; classrooms were transformed to accommodate IWBs and the new teaching methods that highlight and encourage pupils’ interaction with each other and with their teachers. However, as Higgins (2003) points out that the use of ICT is not the only factor that can enhance learning for there are other issues that need to be considered if such technology can make a difference (p.5).

Statement of the problem

Realising that using ICT application in schools deals with more than providing the technology in schools, when King Hamad Future Schools Project was launched, the Ministry of Education conducted and still conducting various training session for teachers to enable them using IWBs effectively and in creative techniques to capture the attainment of the pupils and encourage their participation and interaction. Nevertheless, since its launch, there have not been any studies investigating the impact of IWB on the teaching of English language, Mathematics, Arabic language, and Islamic studies despite being the major subjects which affect the pupils' proceeding to different educational levels or grades. In addition, there have not been any studies investigating the pupils' attitudes towards IWB and its use in any of the major subjects which is essential to the project as one of the main aims of King Hamad Project is to provide pupils with an enjoyable learning experience that would create positive attitudes towards teaching and enhancing the learning process. Therefore, studies examining the pupils' attitude are important to ensure the success or failure of the project.

However, two years after starting the project, Bax (2006) visited some of the schools which had IWB installed in some of their classrooms and expressed his admiration of some Bahraini English teachers using activities that they created themselves and commented that these activities were "amazing in their simplicity and effectiveness" (p. 6). He also pointed out that the example of Bahrain suggests to him that IWB "could eventually become normalised in some language teaching context, if not perhaps all" (ibid). Nevertheless, he stated that there are still some obstacles that prevent normalisation of IWB in Bahrain and mentioned lack of full integration of IWB

materials with the everyday classroom materials and the layout of the classrooms. Despite these obstacles, he predicted that the normalisation or integration of IWBs is possible in the next few years.

Currently, almost all the obstacles that Bax mentioned have been diminished especially in primary schools where classrooms layout has been redesigned to accommodate the IWBs. However, few textbooks materials have not been integrated completely with the technology, but this has not affected teachers' regular use of IWB since most teachers use the different tasks that their colleagues have created and uploaded on the teachers' data bank. Maybe complete normalisation will occur now that the Ministry of Education started the second stage of King Hamad Future Schools Project as it will be illustrated in chapter two which explains the project thoroughly.

Because of this essential need for studies and the importance of English language in the educational system in Bahrain, it was crucial to conduct a study examining the pupils' attitudes towards the IWB and its influence on their learning and on their attainment of new English vocabulary. I chose to investigate the use of IWB in learning new vocabulary because vocabulary is the most highlighted element in primary English curriculum and in primary English text books for Arab pupils. This is because "words are the basic building blocks of language, the units of meaning from which larger structures such as sentences, paragraphs and whole texts are formed" (Read, 2000, p.1).

Thesis outline

The study is divided to five chapters; the first chapter is the literature review which presents a review of studies investigating the pupils' perceptions of IWBs' use and the utilization of IWB in primary education and its influence on the pupils' participation and interaction. Besides offering IWB literature, the chapter also includes a section on how the different IWB features are used in teaching English vocabulary to young learners.

The second Chapter briefly illustrates English language curriculum system and presents a comprehensive description of King Hamad Future Schools Project; the project's goals, motives, and the procedure of implementing the project in all government schools. In addition, it explains the second stage of the project which started in the academic year 2015-2016.

The third chapter entitled *Methodology* illustrates the theoretical framework of the study and provide a detailed description of the research design, participants, and the participating schools. The chapter also offers a thorough explanation of the questionnaire questions and the rationale behind asking each question. In addition, it also provides a detailed explanation of the data collection and analysis plus giving evidence illustrating the validity and reliability of this study.

The fourth chapter concentrates on the analysis and interpretation of the data that was collected for this study. The chapter is divided to three major sections. The first part of the chapter analyses the questionnaire responses that are connected to the

study's first question. The second part analyses the data and the themes that emerged from the observation. The third and the final part of the chapter deals with the findings of the study's third question which were derived from the quantitative analysis of the pupils' vocabulary tests in Year 4 and Year 5.

The fifth chapter illustrates the implication and recommendation of this study. The implication of this study on the IWB literature in general and on the use of the IWB in the government schools in Bahrain in particular. Conclusions are presented according to the research questions posed in the introduction and the third chapter. However, it is important to point out that although the data collected in this study report the benefits of IWB, the impact of IWB is yet unknown and fully explored in King Hamad Future Schools context. I also suggest some recommendations that I believe will enhance the Ministry of Education policy in commencing any new project.

CHAPTER I

LITERATURE REVIEW

When tackling the literature of IWB, I knew that schools started using the technology in the late 1990s and as so I knew that there would be some studies that reflect teachers' and students' perception and use of IWB but did not know the quality of these studies. Thus, I started researching the different academic search engine such as ERIC and JSTOR which I knew will provide me with old and new studies. Being a staff member at the University of Bahrain helped me in accessing ERIC and JSTOR and other electronic resources plus using the university inter library Loan which provide the staff member the articles that they were unable to find locally. I also used Exeter University services to get hold of some articles that I was unable to get from Bahrain University resources.

Despite this, I found that using Google as a starting point was very useful and easier as it took me to all the studies that have been written on IWB including the ones in ERIC, JSTOR, and ResearchGate. In addition, studies such as Higgins et al. (2007) and Cole (2012) that reviewed the literature on IWBs were very useful as they presented me with the earlier and the latest studies.

From all the different articles and studies that I examined, I managed to find more studies that the researchers have mentioned either in their literature review section or in the Reference section. By doing this I managed to create a net like a spider

web where each thread took me to other sources. Although this process was very useful and enriched my knowledge in my area of study, it was time consuming because some of the articles that were linked or that the source connected me to were irrelevant to my study.

1. 1. Introduction

A considerable number of researchers have investigated the impact of technology on language teaching and learning and some researchers such as Crystal (2001) asserted that technologies have the potential to revolutionize the teaching and the learning process, offering students opportunities to learn in new ways. One example of the technologies is IWB which has the potential to improve teaching and learning experiences by offering useful ways for learners to interact with electronic content (Campbell, 2010). According to Bell (2002) the IWB also helps learners to be more responsive to the different learning styles. Hall et al. (2005) claimed that some children favour IWB because of its multimedia versatility, "especially the visual aspects (colour and movement), audio (music, voice recordings, sound effects) and being able to touch the IWB" (p. 106) which Walker-Tileston (2004) explained were the dominant senses that children use in learning. Similar findings were echoed in Yáñez et al. study (2011) who commented that "elements such as the ability to integrate sound, video, text, and animation can support individual learning styles, with the possibility of combining these elements in ways which suit particular sets of learners" (p. 449). This ability transforms the way in which pupils learn (Kennewell et al. 2008) and creates a “technological revolution in classrooms” (Shenton et al., 2007, p. 129) which Jelyani et al. (2014)

argued would develop teachers' teaching and allow them to be in a daily contact with their pupils.

Besides developing the teachers' teaching methods, IWBs also have an impact on altering the roles of both teachers and pupils as the teachers' domination of the lesson decreases and teachers and textbooks are no longer viewed as the sole source of information. By supporting and encouraging interaction and motivating some pupils to share their knowledge with their peers (Jelyani et al., 2014), IWBs have helped in "making learning a social activity" (ibid, page 21) where all parties have an active role. This kind of interaction brings the class together as one pupil in Levy's study (2002) puts it "I like the Whiteboards because they are big and everyone can join in what's going on" and "I think it makes people more interested in joining in and learning" (p. 11). However, according to Cuthell (2005) the significant effect of IWBs is felt in the way that IWBs have changed the way the classroom and the lessons are managed as the interactivity of the boards has helped in making the teacher's role more interactive, and "the learners see themselves as engaged with the process of learning, rather than simply progressing through the scheme of work" (p.3).

In their textbook *Curriculum-Foundation, Principles, and Theory*, Ornstein et al. (1993) assured that the use of IWB helps in developing critical thinking skills and in improving information processing. This is accomplished by promoting discussion among pupils during which they can explore concepts from varying perspectives and social backgrounds. 'Computer supported learning' allows the formation of knowledge through collaboration and communication and "IWBs have the potential to encourage

collaboration by creating a shared learning environment suitable for teaching strategies involving the whole class or small groups" (Bennett et al., 2008, p. 289).

This perspective is upheld by well-known educational theorists like Dewey, Piaget and others who founded the constructive theory that emphasizes learner instigation and involvement in the learning process. The learner is the "constructor of knowledge" and that his/her prior experience enriches the learning process (Lambert et al. 2002, p. 30).

The teacher's role, from the Constructivist point of view, is that of a "facilitator" (BADA et al., 2015 p.68) who helps the pupils in gaining, forming, and sharing knowledge through creating a classroom atmosphere that highlights and prompts collaboration and exchange of ideas. Pupils learn how to "negotiate" with their peers and to assess their contribution in a socially appropriate manner (Ibid). Thus, Constructivism focuses on the learners' role in the learning process in which they engage in important different experiences through which they apply ideas and identify and establish connections between prior knowledge and new one. Such learning concepts can be established through the use of IWB that enables teachers to "become more aware of the nature of interactivity and its stimulation as the basis for conceptual development and cognitive understanding" (Glover et al., 2007, p. 17).

With its ability to ease the inclusion of different types of media within a lesson (SMART Technologies, 2009), IWB could provide means for teachers to address the individual differences of their pupils. This could be assisted by the teachers' adaptation of Gardner's (1993) eight core of intelligence and to incorporate the various learning modalities with IWB's various uses.

In all its forms, technology provides various learning styles for the teachers to adopt, to use, and to encounter with the pupils' different needs (Bryant et al., 2000). Thomas (2003) describes how IWB enhances the teaching and the learning of modern foreign language (MFL) by enabling the use of different materials such as CD-ROMs, internet, Microsoft Programmes in conjunction with the board facility of highlighting, annotating, dragging, dropping and concealing to explain the different linguistic units. As one French teacher comments "you can create sequences linking sound files, web pages, images anything from your desktop and build it up, layer upon layer" (p. 2); such facility may enhance learning because it enables learners to connect what they see with what they hear.

1.2. Computer and language learning

During the years, the perception of cognitive computer-assisted language learning (CALL) has changed; Warschauer et al. (1998) tried to analyse the history of CALL and distinguished three main approaches to CALL: 'behaviouristic CALL', 'communicative CALL', and 'socio-cognitive or integrative CALL' (pp 57 & 58) which they argued have changed throughout the years. They explained that during the 1960s and 1970s behaviouristic approach was implemented and was considered as a broader field of "computer-assisted instruction" (p.57); being based on behaviourist theories of learning, computers were seen as 'mechanical tutors' which focused only on repetitive drills. Nonetheless, as Warschauer et al. explained, this view and use of computers was rejected thus changed in the late 1970s and early 1980s by the creation of personal computers which provided greater opportunities for individual work. The communicative was influenced by the cognitive theories which emphasised learning by means of

“discovery, expression and development” (p.57). Therefore, software developed in this period included programme that reflected this approach; software such as text reconstruction which encourages pupils to rearrange sentences, words etc. The focus in this approach was on the pupils’ interaction with each other while performing these tasks (ibid).

Yet, as Warschauer et al. (2000) explained by the late 1980s early 1990s cognitive CALL received plenty of criticism from teachers who were moving towards socio-cognitive view of communicative teaching which highlighted the use of the language in an authentic social context and integrated different language skills (listening, speaking, writing, and reading) in language learning. This created a new view on technology and language learning which Warschauer et al. termed socio-cognitive CALL. They explained that in order to understand language acquisition, one must understand and appreciate the importance of its social construction thus transforming the emphasis from learners’ interaction with computers to learners’ interaction with each other via the computer (p.58).

This makes the socio-cognitive CALL in balance with the new and current trends in language teaching and language teaching research which views the classroom as a place full of social interaction, where pupils are engaged with each other in authentic language and situations which can be supported by the use of IWB (Warschauer et al., 2000, ibid). Gerard et al. (1999) found that IWB reinforces the teaching process of foreign languages in three main ways: interaction in the classroom; the ‘presentation of new cultural and linguistic elements’; the organizational skills of the teacher (p. 2). In their study they illustrated the various ways in which IWB can be used to enhance

foreign language acquisition. The same theme was picked up by Bell (2002) in her article in which she expressed her enthusiasm for IWB and gave twelve reasons why it is useful to use IWB in an English classroom.

Few years later Gray et al. (2007) conducted a study illustrating some language teachers' integration of IWB in their classrooms. In this study most teachers chose to use PowerPoint with IWB to replicate and enhance their practice during the presentation and practice phases of traditional language teaching. Most teachers participating in the study preferred using IWB with PowerPoint. This was integrated with the use of different websites for practice and the recycle of the different elements of the language.

The study showed that most of the participating teachers felt that the IWB can improve their teaching by enhancing their classroom management and the different tasks they perform. Teachers also praised the ability of the IWB in drawing pupils' attention to grammatical features and patterns and its assistance that seems to develop and enhance pupils' memorisation skills and writing. Moreover, some felt that the deployment of IWB had a positive effect on their teaching and was changing their roles in the classrooms as a 'facilitator'. Still, findings showed that not all teachers viewed their role change as a complete positive experience as one teacher considered herself as a deliverer of materials with less involvement with her pupils.

With the increased use of IWB in teaching, several researchers and well known CALL professionals questioned the potential danger of IWB technology on the principles of 'socio-communicative language teaching' and CALL socio-cognitive approach. While experts like Dudeney (2006) expressed concerns as to whether the poor training of teachers would lead the teachers "finding themselves straight jacketed by the

technology, rather like a presenter at a conference can find herself cosseted by PowerPoint" (p.9). Schmid (2010) examined the role that IWB can play in enhancing pedagogy in accordance with 'socio-cognitive approach' to CALL and stated that two important questions must be addressed: "how can IWBs be pedagogically exploited in accordance with a socio-cognitive approach to CALL?" and "what kind of teacher professional development programme would best equip teachers to achieve this goal?" (p. 160).

According to Schmid this issue has become more significant especially as recent research results show that the typical use of IWB in language classroom would fail on all the criteria that Warschauer (2000) referred to in the main claims of the 'socio-cognitive approach' to CALL. Schmid (2010) stated that numerous research findings drawn from classroom-based research and survey conducted with teachers and learners have illustrated that technology has mostly been used in the classrooms to support the execution of pedagogical activities that represent the 'behaviouristic approach' to CALL; an example of this is reported in Gray et al. (2005, 2007) study which was conducted to investigate the process of IWB technology integration within one foreign language department in a British secondary school.

The study's findings revealed that most teachers used IWB to maintain their control upon the pupils' learning process. They succeeded in achieving this by carefully planned presentations. As the researchers explained, the teachers used the IWB in a way that "every move was carefully choreographed at the planning stage, and materials were created to increase behavioural and linguistic control" (Gray et al., 2007, p. 421). They concluded that in that context the IWB was mainly used to support developing

pupils' knowledge through the use of drill and practice exercises. Similar findings were obtained by Schmid (2008) who highlighted the danger that many teachers fall into by using IWB to enhance their control on the learning environment.

Two years after Schmidt's study, Lakshmi (2012) carried out a study to determine if the use of CALL was useful for a group of pupils in the 1st and the 3rd year at the College of Engineering. She used a survey and a questionnaire in her study; the survey had parameters set as Good/Moderate/Low and Yes/No type answers/intrinsic/extrinsic; the questionnaires had various evaluation criteria to assess. The findings revealed that CALL was found useful and supportive for both the students and the teacher. Lakshmi argued that CALL holds the key to future improvement of pupils in learning English and boosting their verbal skills and confidence.

Researching the IWB literature I have noticed that there has been an inconsistency in the number of studies that were conducted on IWB and in the views or opinions regarding it. As it was noticed that almost all the literature that was conducted in the late 1990s and early 2000s was in favour of the IWB and did not tackle any negative issues that IWB might have. This could be due to various reasons such as IWB's novelty and the enthusiasm that was generated by its use in some schools where some teachers and some educators saw IWBs as the new invention that will change the way of teaching and learning. Another reason could be the lack of sufficient studies investigating the use of IWBs in pedagogy.

Nonetheless, this was corrected in the later 2000s as studies conducted in the second half of 2000s presented more balanced and realistic accounts of the utilization, effects, and advantages of the IWB. It was also visible that in the second half of the

2000s the interests and the studies on IWB seemed to decrease. However, currently this has changed as it seems that the interest in IWB has been ignited again and more studies on IWB are being carried out and are emerging; although this increase is slow, it seems steady.

Most of the studies that I came across from 2011-2017 were conducted in Turkey. This I believe is due to the Turkish Ministry of National Education's introduction of a project called `Fatih` which aimed to improve learning opportunities by integrating latest technologies such as IWBs in educational settings throughout the country. The significance of these studies for researchers examining the effects of IWBs on learning and teaching is that they explore the usage and the perception of the users towards IWBs; users who come from the different school levels plus higher education.

Besides presenting studies with pupils' perception, some studies such Celik's study (2012) investigate the perception of teachers who have just started using IWB. Nonetheless, like this study, the findings of these current studies cannot be generalised as they are too specific relating only to learners and teachers in Turkey. Still, it seems that scholars and anyone who are interested in IWB and its application in education should be grateful for this wave of articles from Turkey that swept and continue to sweep the world of ICT and provide them with up-to-date studies.

For the purpose of this study the following literature section will be divided into two major sections: the impact of IWB on pupils and the use of IWB in primary education.

1. 3. The impact of IWB on pupils

While examining IWB literature the following themes emerged that are related to this section and to this study:

1.3.1. IWB and pupils' learning

Various early studies emphasised the role that IWB plays in enhancing learning by offering teachers unlimited access to resources. One of the earliest studies that emphasised this fact is Levy (2002). Through her interviews with participating teachers, the teachers revealed that IWB enabled them to utilize a larger number and wider variety of resources and offered them easy and effective ways to demonstrate software. Despite this, some learners were concerned and felt that the use of IWB facilitated quick access to different materials which may sometimes be confusing and complicated to take in. Few years later this feature was also questioned by children participating in Higgins et al. (2005) study who felt that IWB made their teacher move too quickly across different materials in the classroom; similarly Schmid (2008) believed that easy access to various information may leave pupils feeling "overwhelmed by the amount of information they need to acquire in a short period of time, or by the amount of multimedia resources they are exposed to in class" (p. 1562).

Because of IWBs novelty for most teachers, Becta (2004) published a guide for primary teachers to help them get the most of the technology. The guide helped teachers to identify the various advantages of IWB that affect pupils; advantages such as IWB ability to increase the enjoyment and the motivation factors; providing greater

opportunities for participation and collaboration; and accommodating different learning styles.

It is these features that have been credited by many researchers for boosting pupils' learning and inspiring numerous teachers to further their teaching skill and facilitate learning (Campregher, 2010). Other scholars such as Glover et al. (2007) underlined the auditory feature of IWB; while others highlighted the visual and the auditory factors' enrichment of learning (Bell, 2002; Beeland, 2002; Miller et al, 2002; Cunningham et al. 2003; Schuck et al., 2007).

For example, the visual aspect of IWB was greatly emphasized in studies investigating the effects of IWB in teaching mathematics and science subjects. Miller et al. (2005) indicated "one of the gains of IWB technology is that teachers have access to many presentational techniques or 'manipulations', that can enliven understanding and learning" (p.106). Hennessey et al. (2007) echoed similar sentiment and asserted that "manipulable objects of joint reference afforded by the technology were exploited in order to focus thinking on key scientific concepts and processes, to unpack, explain and 'organically' build them up, and to negotiate new, shared understandings"(p.11). Mildenhall et al. (2008) noted how "IWB allows virtual manipulatives to be viewed by the whole class rather than crowding around one small computer monitor" (p.13). However, for the pupils in the studies conducted by Higgins et al. (2005) and Slay et al. (2008) the key for triggering and accelerating learning was operating the IWB themselves.

IWB effects on learning were also acknowledged by later studies. Durán et al. (2011) highlighted the fact that teachers can present the pupils with a wider range of activities and pay more attention to different kinds of tasks which undoubtedly, help

improve the learning process. Two years later, Aytaç (2013) study revealed that besides enhancing learning, IWB also influences learning styles as well as increasing pupils' motivation. Öz (2014) on the other hand looked at the technology's role in assisting teachers and noted the opportunities that IWB technology provides for teachers to help them facilitate the learning process.

1.3.2. IWB and pupils' achievement or academic performance

While the effects of IWB on enhancing learning was and is still very definite for many scholars, IWB effects on the learners' achievements or academic performance in tests were and are not yet definite; as studies that examined the relationship between the use of IWBs and pupils' attainment have revealed mixed findings. Zittle (2004) investigated the impact of the technology on primary school pupils' achievements in geometry. Sstudents from 3rd and 4th grade Navajo children took part in a multimedia-enhanced geometry lesson on the topic of three-dimensional cubes. The comparison group received instruction using the lesson at desktop computers, while the experimental group received the same lesson with their teacher using IWB. Many of the lessons used in this study were developed from materials collected from teachers participating in major professional development initiatives, such as two Technology Innovation Challenge grants in New Mexico and Arizona, and the National Teacher Training Institute in Arizona. Teams at four universities, Dine College and NITI (National Indian Telecommunications Institute) then fine tune the materials and add multimedia to create lessons for electronic delivery. Once the lessons were completed, they were downloaded in an online database where they were available for teachers and students.

At the end of the study's period, the study compared the pre-test and the post-test scores of pupils who were taught with IWB with the scores of the pupils who were not taught by IWB; significant statistical differences were reported between the two groups' tests results; the group that studied with the IWB achieved higher scores.

Despite this, in a critical review of the IWB literature Smith et al. (2005) noted that "there is insufficient evidence to identify the actual impact of such technologies upon learning either in terms of classroom interaction or upon attainment and achievement" (p. 91); and two years later Higgins et al. (2007) study echoed similar sentiment as after two years of investigation, Higgins et al. recorded no significant differences in the test scores of those schools that used IWB and those that did not. In the same year Martin (2007) reported parallel findings so did Schuck et al. (2007) who compared mathematics and science tests scores of primary classrooms taught with IWB with the scores of classrooms taught without IWB.

Nevertheless, in their two years of study on the effect of IWB on children's attainment, Lewin et al. (2008) concluded that children who had been taught with the IWB showed positive gains in literacy, mathematics and science and managed to make an exceptional progress in national tests.

In Phase 1 of Lewin et al. study, the researchers chose ten schools as case study and visited them for 2 days on two-three occasions between February 2005 and April 2006. The schools were demographically the same and had an appropriate mix of ethnic and socio-economic groupings; they also included nursery, infant and junior phases. For collecting information, the researchers used classrooms observations

which were video recorded and they also interviewed the learners, staff, and managers. The video recording provided a good examination of the use of IWB in teaching.

The analysis of the data was undertaken collaboratively as the whole team shared three key episodes from each classroom observation. This as the researchers say provided a very powerful and insightful task which was both stimulating and enabling better grained observation of things that usually would not be noticed. In addition, the collaborative work enabled others to see important things in different perspectives as each individual researcher had different background and experience. This process helped the team to develop a shared understanding of how to investigate which facilitated their progress from Phase 1 to Phase 2 drawing on solid theory principles. As for the interviews, the researchers used them to elicit accounts which allowed them to infer much tacit knowledge and to interpret the data from different angles which assisted in developing a detailed account of pedagogic practice.

According to the researchers, one of the aims of Phase 2 was to record and follow the changes over a period of time. Another was to find confirmation or disconfirmation of the provisional findings that were reached from Phase 1 analysis. For example, the quantitative analysis of Phase 1 suggested that students with low attainment were not benefiting from the use of IWB in their teaching; thus, in Phase 2 the researchers were able to investigate the reasons behind this. They chose nine teachers from seven schools whose classes in 2005 National tests had shown progress (identified through MLM) between the baseline and post-test results that differed from the main trend. However, the visiting researchers were not informed of this fact, so they were unaware of whether the classes they were visiting had performed better or worse

than average. This arrangement was orchestrated to prevent foreknowledge that enabled the team to make unbiased observation in classrooms where the use of IWBs had become embedded in teaching and learning with more than 2 years. It was then possible to develop theories that explained why the progress between the baseline and post-test had been different from the main trend in these classrooms. As in Phase 1, in Phase 2 the teachers, groups of their students, and their head teachers were also interviewed. The nine teachers who participated in Phase 2 case studies were asked to consider the findings which were identified in Phase 1 on the use of IWBs and state whether they agree or disagree with them. Besides getting an overall positive agreement from this exercise, in Phase 2 the researchers gained new insights and also were able to confirm Phase 1 findings through further observations.

Data were analysed through socio-cultural lens depicting the role that IWBs played in helping teachers in adopting and developing new ways to teach different tasks. As with all new technologies, teachers develop new ways to make new technology fit to their students. Data also showed that “young children with limited writing skills, and older pupils with special educational needs are highly motivated by being able to demonstrate their skills and knowledge with the tapping and dragging facilities of the IWB” (p. 291). These effects were especially apparent when children were working individually or in small groups. The IWB had also great impact on the pupils -teacher interaction. This, as the researchers point out, is especially evident with teachers who had been using IWB for a considerable period of time as “teachers learn how to mediate the greatly increased number of possible interactions to best aid pupils’ learning” (p. 292).

Two years later López (2010) asserted that "the peer-review literature is presently void of empirical studies that investigate the efficacy of IWB technology in affecting student learning" (p. 902). In his study which he used quasi-experimental design to investigating whether digital learning classroom with IWB has any impact on the pupils in 3rd grade mathematics and in 5th grade mathematics and reading. Findings revealed that digital classrooms with IWB had increased the achievement of English-language learners (ELL) in 3rd grade mathematics and in 5th grade mathematics and reading compared to ELL pupils studying in a conventional classroom i.e. without IWB. Moreover, the t-test statistic confirmed that the Digital Learning Classroom helped in increasing ELL student achievement in 3rd grade reading. Teachers also reported difference in behaviour between the ELL pupils taught by IWB and those who were taught without the technology.

Similarly, some studies investigating the impact of IWB on the learners' achievement in math have also claimed its influence on the learners' achievements; Greene et al. (2013) findings suggested that pupils were excited to interact with the IWB and were more focused on the subject matter which helped them retain information and apply their knowledge to new contexts. As a result, their test results and overall course grades improved. Yorgancıoğlu et al. (2013) claimed that IWB has not only influenced pupils' achievement but also has affected their attitudes towards mathematics (cited in Tunaboylu et al. pp. 82-83).

These positive findings however were questioned in later studies. For example, in 2013 Norouzi et al. found that IWBs had no effect on Iranian EFL learner's retention of new vocabulary.

In the study Norouzi et al. selected 50 students randomly from the five schools that had IWBs in Komijan. These students were evaluated by proficiency test in which 16 students who were on high or low level of proficiency were excluded, and 34 students were selected and a check list of 25 words was prepared. To ensure the level of the words, the researchers gave these words to several secondary learners who were at the same proficiency level of the pupils who were participating in the study and asked them to write the meaning of the words they knew in 25 minutes. Next, the fifteen unfamiliar words were selected for the study's pre-test. Since four students were absent in the first session, the final number of the participants in the test were 30.

After taking the pre-test, the participants were classified to two groups: the experimental group and control group. The experimental group was taught by IWB while the control group was taught by traditional whiteboard. After two weeks all participants took a post-test.

An analysis of the data of the two groups has shown that IWB had no effect in improving students' vocabulary retention in the experimental group thus teaching vocabulary using IWB has no significant effect on learning vocabulary.

Similar to the previous study, Ajelabi (2015) findings also revealed that there was no significant difference in the academic achievement of the group of pupils who were taught using the conventional lecture method combined with IWB, and the other group who was taught the same lessons using the conventional lecture only.

In a report published in 2016, Karsenti asserted that only few studies "have attempted to assess the educational impacts of IWB empirically" (p. 5). He argued that

he found many studies with pedagogical recommendations but not so much about the real impact of IWB on learning except studies by Hennessy (2014) and Hennessy and colleagues (2006, 2007, 2014).

In the same year, 2016, Kyriakou and Higgins published a very interesting study in which they reviewed some of the studies that were conducted to examine the impact of IWBs on teaching and learning. For their study the researchers did a systematic review of all the studies that were conducted investigating IWB impact on teaching and learning. To achieve this, Kyriakou and Higgins followed Fink's (2005) seven steps. Applying these seven steps, the researchers started online gathering of data. For this search specific terms that had the most effective searching results were used. Through this process, researchers identified 14,735 studies which were filtered to 57 studies. Next, a quality criterion was used by the researchers for causal inference which resulted in excluding more studies, ending up having only 16 papers to be included in the study.

For analysis, the researchers had six categories which they put in tables. The first table gave a detailed description of the studies in terms of subject in which IWB was used in, the number of sample/participants, research methods, and the results of each study. The second table illustrated the categories extracted through the data such as the Pupils' Scoring, Length of time of IWB experience, Gender, Pupils' abilities in terms of scoring, Comparing IWB with other sources and techniques, and the final category Classroom Interaction. The third table showed the studies and their points of strength and weaknesses. It also gave the studies' statistical details.

Kyriakou and Higgins explained the reasons for including each category and provided critical analysis of the different studies and highlighted the contrast in their findings. They concluded that “there is a general agreement in all the studies that were reviewed that IWBs have no effect on the pupils’ achievement level and that it does not seem that IWB influence the quality of the lessons. They also argued that the diversity of the IWB’s use lies in three main categories: “1) the subject taught; 2) age of pupils; and 3) particular type (s) of use” (p. 17).

As a researcher interested in IWB, I found this paper very interesting because it provides researcher like me a critical analysis of the various studies dealing with the impact of IWB on learning and teaching. It also provides researchers with a method for analysing and evaluating the different studies which would assist researchers in either including or excluding studies from their work.

1.3. 3. IWB and pupils’ concentration, interaction, and perception

These three aspects of IWB’s impact on learners were always investigated together by the scholars thus it was thought that it was appropriate that I follow in the footsteps of these scholars and allocate the literature that reflected these aspects in this section.

Beeland (2002) conducted a study to determine the attitude of both teachers and students toward the facilitation of IWB in instruction and the effect that it has on students’ engagement. Two instruments were used for measuring students’ engagement and motivation; the first instrument was a survey which was given to the students immediately after a class where IWB was used. The information that was received from this survey was used to determine the student attitude towards the use of

IWB in the classroom. Student attitude was also measured by having two students from each class complete a questionnaire. The selection of these two students was assigned to the participating teacher who was instructed to choose one student who was most likely enjoyed having IWB in the classroom and another who most likely did not.

The learning modalities addressed by the methods that teachers used in conjunction with the IWB were also recorded. For achieving this, the researcher used a form to record this information during the class and from these recording the researcher managed to identify which learning modalities (visual, auditory, and tactile) were addressed through the use of the IWB.

Teacher attitude toward using IWB as an instrument of delivering instruction was also measured using modified version of the Teachers' Attitudes Toward Information Technology instrument originally created by Dr. Rhonda Christensen and Dr. Gerald Knezek. Teachers were also asked to complete questionnaire which enabled the researcher to identify the reasons behind using IWB as means of delivering instructions as well as choosing particular methods of using it.

The analysis of the data showed that IWB can be used in the classroom to increase student's engagement during the learning process. Beeland argued that the study's findings would be helpful for schools and schools system leaders when deciding future spending of technology funding. He also pointed out that based on the findings he would recommend the purchase of the IWB. However, despite his clear enthusiasm, Beeland pointed out that there were still many issues related to the use of IWB in classrooms that needed to be examined.

In a report published by BECTA (2003) IWB was found to “facilitate student participation through the ability to interact with materials on the board” (p. 1). Besides facilitating the interaction with materials, Levy (2002) found that the technology had also increased teacher-student interaction and encouraged pupils to ask questions. Through interviewing the children in her study, Levy also concluded that these children liked IWB lessons because they were quicker, humorous and more exciting than lessons taught in the conventional way. This view echoed 11 years later in Aytaç (2013) study when pupils “agreed that using an IWB is motivating, engaging, and enjoyable” (p. 30).

Miller et al. (2002) conducted a study in the same year as Levy’s in which they concluded that IWB changed the pupils’ attitude and made them more receptive to discussion and were more supportive to each other and had positive attitude towards IWB. Few years later, Schuck et al. (2007) commented on the pupils’ interaction and concentration on their learning and said that in general they were on-task and motivated. Other researchers found that in addition to encouraging participation and concentration, IWB also encourages and enables collaboration in the classroom (Gray et al., 2005; Minor et al., 2013).

Many of the studies that were conducted looked at the influence of IWB on teaching science and math. Smith et al. (2005) argued that IWB facility to boost interaction is important for the teaching of science as pupils’ comprehension depend on interaction. The same point was picked up by the pupils in Slay et al. (2008) study who expressed their satisfaction of the interactivity aspect of the IWB which they said generates more eye contact and interaction between them and their teachers, but pointed out that they prefer having a computer and a projector rather than IWB because

of their teachers' informality with the technology. Northcote et al. (2010) argued that IWB interactivity shortens the distance between teacher— pupils and pupils — pupils interaction.

In their study investigating the reason for using or not using IWB in Taiwanese elementary mathematics and science classrooms, Jang et al. (2012) said that all the teachers who had used IWB agreed that the IWB "allows them to get pupils' attention and helps pupils concentrate; increases interactions between themselves and students" (p.1459). Greene et al. (2013) explained that having the IWB in the classroom has increased student engagement with the lesson and it seemed to make them more interested in the topic. In Chen et al. (2013) the pupils' responses suggested that the IWB teaching enabled them to efficiently interact with their teachers and they also displayed positive perception towards IWB and indicated that they would like teachers to use IWB in the classroom. Similar positive perception and attitude were noted by the Iranian pupils who experienced using the device in their English as a Foreign Language (EFL) lessons (Bajoolvand et al., 2014).

Parallel findings were reached by Yang et al. (2015) where the study revealed that the group which was taught by IWB had a more positive attitude regarding their learning environment; and that the presence of IWB meant less lecturing and more active pupils' participation than the group that received instruction in a conventional ICT integrated learning environment (Microsoft PowerPoint slides with a projector and a conventional projection screen).

A year later Karsenti (2016) published a study in which he investigated IWB uses, benefits and challenges; in the study he surveyed 11,683 pupils from 4th year

elementary to 5th year high school and 1,131 teachers at Québec schools. The findings showed that “the more the students worked with IWB, the more positive their perceptions of its impacts on their academic achievement, school motivation, concentration in class, and over all their satisfaction at school” (p. 26); although 99.2% of the students preferred IWB over the conventional blackboard, 26.4% of the teachers preferred the conventional blackboard. The study also showed that 3.8% of the high school students thought that IWB lacked interactivity; as one high school student explained, “there’s only the teacher talking all alone […] we students don’t do anything[…]” (p. 23). Another element that created negative perception for the students is the technical problems that the teachers appeared unable to fix which resulted students losing their motivation as one student put it “at first, I liked it [IWB…] but after a while […] it got boring” (p.23). Attitudes like these were recorded by Aytaç (2013) who said that participating students reflected positive perception towards IWB but argued that the more IWB is used in the classroom, the more students’ attitude towards the technology became passive.

1.4. *IWB Studies in primary education*

Although some studies which looked at the effects of IWB on primary pupils have been referred to in previous sections, there are very few studies that examined the young learners’ opinion and attitude toward IWBs. Thus besides giving details of some of the early literature and studies that investigated the employment of IWB in primary education, this section will highlight only the studies that reflected and investigated the children’s opinion and attitude on IWB use and effects and will illustrates how IWBs are used in teaching vocabulary.

One of the earliest scholars who conducted such studies is Cogill (2002) who conducted a small-scale study in two primary schools and worked with five teachers, three of whom had full access to IWB in their class. The aim of her study was to investigate the use of IWB in the primary classroom and to see how it may affect teaching and teachers; she also wanted to examine how interactive tools were being adopted for use in the context of a whole class teaching.

To reach a fuller understanding and more comprehensible perspective, Cogill used classroom observation and interviews which were conducted with both teachers and children who were selected by their class teacher. The children interviews were semi-structured and were undertaken immediately following each observed lesson. Interviews were conducted in groups which each consisted of three children.

The study showed that teachers as well as children were enthusiastic with the use of IWB. The statements of the teachers who had full access to IWB seemed to suggest that the tool was used throughout the different curriculum areas and with many software applications, the internet, and CD ROM. Teachers and children alike seemed to enjoy many factors of IWB such as its large display which enabled children to read and see what was written or shown on the screen. Children particularly seemed to enjoy the images that IWB provided and the fact that they could adjust and display them; they also enjoyed creating their own multimedia. Plus, both teachers and pupils expressed their satisfaction with the interaction and the collaborative work that IWB promoted between the teacher and the class and between the pupils themselves.

However, at the end the of her study, Cogill pointed out that there were some areas that needed to be investigated such as the effect of IWB on teachers' relationship

with their pupils as according to her, this was not fully investigated in her study mainly because she had no prior knowledge of the teachers' behaviour before the use of IWB. She also suggested that there should be more studies investigating the effects that IWB may have on the teachers' pedagogical approach in the long term.

Although Cogill concentrated more on investigating the teachers' use of IWB and its effects on their teaching, she did look and report the children's views on the technology. However, this aspect was neglected in other studies that followed Cogill's as the following sections will show.

In the same year, Solvie (2002) conducted her first study in which she investigated the relationship between the use of an IWB as a delivery tool for literacy instruction in a first-grade classroom and the children's concentration and participation. The findings revealed that IWB made children atheistic about learning. Similar outcomes were displayed by her second study (2004) which she conducted to investigate the effectiveness of IWB; she explained how the first graders loved using the markers as well as their fingers because it allowed them "to feel the shapes of words they outlined, feel and see letter components that created sounds they uttered, and experience a true "hands-on" approach to creating and erasing text" (p. 485).

Besides engaging and keeping the children concentrated on the lessons, Solvie found that IWB also facilitated early reading instruction and the use of video and audio materials "provided sensory data, prompting engagement in the language and literacy lessons" (p. 486).

Because of the novelty of IWB, Becta (2004) published a booklet entitled '*Getting the Most of your Interactive Whiteboard: a guide for primary teacher'* which aimed to

assist and educate primary teachers how to use the technology to gain its greatest effects. The content of this booklet included a first section which informed and introduced IWB to the primary teachers and all the benefits teachers could use in their teaching. The second section of the guide taught teachers how to manage a classroom which had the technology and how they could develop their teaching strategies using the technology. The third and the final section of the guide informed them of all the research that had been done with regard to the interactive board and how they could get more information and advice from Becta.

Till this day, IWB literature lacks sufficient studies that examine and present the children's point of view regarding this new technology. Only few studies tackled this aspect. One of the earliest studies that looked at this aspect is Hall et al. study (2005) who in their study gave an explanation for the lack of such studies; "most of the input about IWBs has come from the manufacturers, policy makers, academics, and teachers, there has been very little from pupils as to what they think about IWB" (p. 103).

Their study involved 72 primary pupils at Year 6 (between 10 and 11 years old), who the researchers wanted to examine "what they like, do not like and would like more of in their lessons" (p. 103). The results showed that children were very enthusiastic about the IWBs versatility in the classroom and their multimedia capabilities as one pupil explained "on that (PW) it's really boring, you feel like you're going to go to sleep. But on that one (IWB) you're like still awake and I'm interested" (School 7)" (p. 106). The pupils also liked the fun factor and the enjoyment aspect that IWBs created in the learning process. However, they highlighted the technical problems that they and their

teachers faced with IWBs; problems associated with the software and the technology itself. The pupils also emphasized the positioning of the IWB that affected their seeing the board and their teachers and their lack of IWB skills.

In the same project, Higgins also collaborated with Wall and Smith (2005) and carried out a study which aimed to collect information regarding the children's opinions of IWB and the impact this device can have on teaching and learning. The study looked at the introduction of IWB into Year 5 and Year 6 in selected primary schools. The researchers used a template to encourage groups of four to six children to talk about learning with IWB, and the data was collected by interviewing the teachers as well as the pupils.

Most of the children's comments were positive and various themes emerged from the analysis of the children's comments inside and outside the speech bubbles in the templates. Children thought that the use of IWB facilitated their learning. This was attributed to the use of different software, the visual display of information, and the use of games. They also believed that IWB assisted them to remember things, to think around ideas, and to concentrate which motivated them to participate.

Many positive statements were also mentioned with regard to IWB initiating learning; the most frequent themes that emerged from the children's statements, in ascending order, were 'motivational', 'fun', 'attention', 'interesting', 'confidence', and 'prepared to learn' (p. 859); within the motivation factor which was indicated as a key factor impacting upon the pupils' metacognitive process, motivation from a desire to have the work shown on the board and to use the board themselves. Children also praised IWB for providing them with different learning style; as most of them associated

the IWB with the visual learning; while others valued the social verbal interaction that IWB triggered and the sharing of information among each others.

Besides stating the good effects of having an IWB in their classrooms, participating children also mentioned some negative points regarding the technology. One of the most common factors is the technical difficulties; the technical reliability echoed a lot as many children expressed their frustration by the IWB "breaking down" (p. 863) and "the need for recalibration in the middle of the lesson and its impact on teaching and learning" (ibid). Several children viewed insufficient opportunities to use the IWB as a drawback while others picked the problems with software and hardware that they and their teachers faced as a negative.

Some children however saw that IWB had a negative impact on their teachers. This view included the IWB impact on the pace of the lesson as "sometimes teacher moves on too quickly (boy, age 11)" (p.865). Another issue was the teacher's ICT proficiency; some thought that their teacher lacked the technical knowledge to operate and fix the IWB.

The above study in my point of view is one of the most important studies that dealt with the use of IWB in primary education because since 2005 it has provided the academic world a comprehensive look at the children's views with regards to the use of IWB in primary classrooms. However, it is essential to remember the limitation of this study and the fact that like any other studies its findings cannot be generalised.

Campregher (2010) conducted a study in two Year 5 primary classes in Trentino, Italy, for a total duration of seven months. The study's aim was to examine the IWB

effects on the children's learning, motivation, involvement, independency, concentration, attitude towards the school environment, attributes and metacognition.

To establish this, Campregher had an experimental group and a control group; the experimental group had organized its activities in Cooperative Learning using the IWB. The control group carried out its activities in Cooperative Learning without using the IWB, in a method usually used by the teacher. For collecting the data, the children in the two groups had a Questionnaire and underwent a pre-test and post-test (after 3 months) and the researcher used researcher diary records, video recordings, and structured observations.

The results revealed that there was an increase in pupils' acquisition and maintenance of learning. This, as the researcher explained, could be the result of IWB's features which enabled pupils to have more significant interactive experiences in the classroom, "due to the fact that this technology meets different cognitive styles and multiple intelligences" (p. 4). Campregher also stated that like Higgins et al. (2005) findings, his study's finding also revealed that the visual feature of the technology played a great role in stimulating the pupils and helped them to understand the teacher's explanations. As for speaking, they benefited from the discussions and the interaction between the peers themselves, with their teacher, and on the interactive board. From the data it was also evident that the group using IWB showed an improvement in motivation, concentration, independency and the attitudes towards the school environment.

In the same year, Coyle et al. (2010) conducted a study examining the effects of IWB on teaching and learning in monolingual contexts where English was the first

language for learners. The study was carried out in a Year 3 classroom in a British primary school in Spain with 12 pupils of which seven were Spanish-speaking children, four were native speakers (NS) of English, and one bilingual child speaking Spanish-English; all ages ranged between 7 and 8 years. The researchers wanted to find out what kind of interaction takes place in a monolingual classroom where IWB is used and the role that the technology plays in meeting the learning cognitive and linguistic needs of the non-native speakers of English (NNS).

For collecting the data, Coyle et al. video recorded two 50 minute lessons of Literacy and Numeracy. The data was transcribed in detail and then analyzed through careful reading of the transcripts. Focus was directed on those who used the interactive board; and whether they used it as an ordinary whiteboard or interactively with a commercial software program and for how long. Using the Self Evaluation of Teacher Talk (SETT) framework the lesson transcripts were coded separately by the three researchers and then the results were compared, negotiating any differences of opinion until reaching full agreement. The results revealed differences between NS and NNS engagement in the interaction which suggested that the teacher found it difficult to balance the class's learning needs with the individual linguistics need of the NNS pupils although these made up the majority of the class. This as the researchers argued could explain why the teacher engaged in lengthy explanation from the IWB without checking the comprehension of the pupils and engaging with the whole class rather than engaging with individual learners in particular. it also explained why she accepted non-verbal or short responses from the NNS without encouraging them to produce longer or more complex responses.

In general, Coyle et al. argued that from the study it could be concluded that IWB does have the potential for making a successful impact on the quality of classroom interaction; its interactive software can enhance children's concentration on the lesson permitting them to visualise and to easily identify errors and encouraging sharing of knowledge through talking and listening. However, this depends completely on teachers, and their use and their technological literacy of IWB. This highlights the importance of training and developing teachers' technological competence which would enable teachers to best exploit IWB versatility in the classrooms. In addition, training should also focus on enhancing teachers' interactional skills because this will assist teachers in second language and immersion classrooms "to create opportunities for verbal interaction which complement and build on the children's tactile interaction with the IWB" (p.624).

Other researchers who investigated the children's views on IWB are Syung Lan et al. (2011) whose study combined methods used by Beeland (2002) and Hall et al. (2005). They divided the participating pupils from middle grade Year 3 and Year 4 and higher grade Year 5 and Year 6 in four classes. To measure student engagement, the researchers used a modified version of the student engagement questionnaire which was originally created by Beeland (2002). The questionnaire had five subscales: enjoyment (8 items), anxiety (8 items), importance (8 items), skill (8 items), and effects (8 items). All forty questions had a 1-4 scale; the responses indicated that 1 strongly disagreed, 2 disagreed, 3 agreed, and 4 strongly agreed.

Using Hall et al. (2005) main questions, Syung Lan et al. interviewed the pupils who were put in groups composed of 15 pupils. The analysis of both questionnaires

showed that there were considerable differences between middle and high grade pupils in the enjoyment scale on item 2—“I enjoy lessons on the interactive whiteboard” (p. 174); similar result was echoed in anxiety subscale on item 10—“Using a white board doesn’t make me nervous” (ibid). These differences continued in importance subscale as there was significant difference between the middle and high grade pupils on item 19—“I think that every lesson should be taken by an interactive whiteboard”, item 21—“I would take more time to learn when teacher uses a white board”, item 23—“I think it is important for the teacher to use an interactive whiteboard on instruction”, and item 24—“I think interactive whiteboard will replace computer” (ibid). Unlike higher grade pupils, middle grade pupils did not think that every lesson should be taught by the interactive board, and they would also take more time to learn when teacher uses IWB than higher grade pupils.

Like the questionnaire, interviews also reported differences in viewpoints; when pupils were asked about the advantages of the IWB, all agreed on the fun factor of the device and its ability to combine with other facilities; plus the fact that they do not need to clean it. As for the IWB ability of providing a better learning experience, 90% of the pupils had positive comments on this question; only few pupils had opposite views; some felt that there was no connection between paying attention to the lesson and having an interactive board in the classroom. One student believed that it wasted time while another complained about the teachers spending much time operating it. Pupils also felt that IWB hardware can still be improved. Still all were very optimistic about the technology and suggested some ways in which the IWB can make the lesson more interesting.

In the same year, Manny-Ikan et al. (2011) investigated the children's views and examined the various contribution aspects of the IWB to the learning and teaching process. The study was conducted on a pilot project of six schools in Israel which implemented "the SMART project" (p. 250); the study included six principals with different working experience; additional participants were six innovation leaders - teachers whose job was to integrate new technologies into the school; 12 teachers (two teachers from each of six participating schools) who taught various subjects using IWB and whose average experience was 20 years, and an average of two years using IWB. In addition, 838 pupils responded to questionnaires at the beginning of the year, and 636 pupils responded to another at the end of the year; plus three pedagogical coordinators whose job was to implement the project in the different schools.

The researchers used different questionnaires for different participants and also used Student Focus Group, chart of data on how IWBs are used in each school and observation. The study revealed similar findings to Hall et al. study (2005) as the children in this study demonstrated positive attitude towards learning with IWB and expressed their enjoyment of learning with the technology; they also reported the technology's input on their learning especially their understanding of the materials and their desire to engage in the learning process.

Like the pupils, the teachers too revealed positive attitude and noted that teaching with IWB provided their pupils the tools that will make their learning more effective; for example, it helped in developing an autonomous learner and higher order thinking skills. In interviews, teachers also indicated that despite the time that it took

them to prepare lessons, the advantages of the technology were greater especially in terms of the pupils' motivation, interests and concentration, and IWBs support different learning styles. Teachers also felt that they became better in planning lessons, presenting the learning material more clearly, and being up-to-date.

As for the achieving factor, participants held opposing views; although the majority of teachers, innovation leaders, and Principals thought that learning via IWB can positively influence student attainments, the majority of the children (58%) felt that their achievements will remain the same. The difference in responses as the researchers explained "raises the question of whether student attitudes stem from the fact that they are aware of the fact that the skills and methods of learning with the IWB are not always evident on standardised tests" (p. 266).

Another explanation for the different views, as Manny-Ikan et al. illustrated, is that sometimes pupils view learning with technology in general, and with IWB in particular, as a game whereas during times of pressure, the technology is disregard and teachers go back to the traditional "teaching to the test" (ibid). This could lead the pupils to feeling detached towards learning via IWB and their scores on standardised tests.

Two years later, Aytaç (2013) conducted a study in which he wanted to examine the Turkish pupils' opinion on IWB and the problems they face while using it; the 202 participants of the study were pupils from a primary and a secondary school in Ankara which were chosen for the initial pilot implementation of FATIH project. The data for this study was collected through the 'Student Interactive White Board Survey Questions'

which was designed by the researcher Sezgül (2012); the questionnaire consisted of questions on demographic, usage, and pupils' perception.

The analysis of the data revealed that most of the pupils agreed that using IWB was engaging and enjoyable; they also felt that it can improve the learning process, influence learning styles, and increase motivation. Pupils also believed that the IWB had a positive effect on their academic achievement. However, the study showed that pupils often complained about technical problems, and both primary and secondary pupils felt that their teacher lacked efficiency when using IWB. The findings revealed that pupils will have positive attitude towards IWBs if their teachers uses the technology effectively. If the teacher lacks confidence and technical efficiency, opinions can change and IWB will be perceived as another presentational 'gimmick' (p. 1913).

Pupils also stated that IWBs seem to enrich teaching methods but weaken pupil - pupil interaction. They explained that the more teachers used the IWB the more they became passive thus "the study showed that the use of IWB in a constructivist frame does not provide a positive contribution to student-student communication" (p. ibid). This study highlighted the importance of teachers who according to the pupils are the main factor that affects the effectiveness of IWB as their ICT literacy plays a big role in their use of IWB.

One of the latest studies that looked at the teachers' and the pupils' views on IWB is Tertemiz et al. (2015). The study was conducted in a private primary school in Istanbul and included children from Year 1, 2, 3, and 5, as well as the class teachers of Year 1, 2, 3, 4, and 5. The tool that was used to collect data was semi-structured

interviews which were undertaken in the participants' classrooms. The interview forms were developed separately for teachers and pupils and the teachers' interviews took fifty minutes to administer while each interview for children lasted forty minutes and administrated in focus group with 8-10 pupils.

The data was analyzed using content analysis and the results were grouped into two; the teacher's views included teacher-based characteristics and their views on the IWB; the children's views included their positive views and the negative remarks. The teachers expressed positive attitude towards the IWB and indicated that nearly all of them used it in all the courses however six of the teachers reported that they used IWB mostly for science, technology, and math courses; two stated that they used it for teaching Turkish language and the life science courses. However, all teachers agreed that basic computer skills are needed to use IWB and that the IWB assisted in attracting the children's attention and had very positive impact on their learning. They also indicated that they liked the fact that the IWB supported their teaching methods and techniques as well as targeting all types of intelligence.

Like the children in the previous studies, the children of this study expressed positive attitude; as each grade level illustrated an improvement in their concentration when materials and activities were taught via IWB. Findings also reflected the IWB's positive effects on the children's learning; this was illustrated in the Year 2, 3, and 5 and in children's statements. Children also said that they regarded IWB exciting and interesting because of its technology. When asked what excited them most about the IWB, a student in Year 1 said "because the tool is electronic" (p. 1295); but like in

previous studies, the children also reported their dissatisfaction with the technology in terms of its eyestrain due to poor lighting and the undesired ads that pop up when using the internet which a student in Year 5 said “it distracts my attention ...” (p. 1295).

1.4.1. The utilization of IWB in teaching vocabulary

Teachers of English language view multimedia as a medium for delivering interesting lessons in which learners learn the language in a simple and effective way. Teachers of English use it especially for the memorization of vocabulary as the “interaction between sound, the written word, and the image of objects presented is considered to enhance memorization (sic) considerably” (Schmid, 2008, p. 1553).

Although computers connected to IWB can ease this integration and provide ways to support the learning and the memorization of new words, when examining the literature of IWBs use in teaching English language it is clear that there are very few studies that researched the use of this technology in teaching vocabulary. In actual fact, there is little research to support claims that IWBs enhance vocabulary retention and what research there is may not be completely objective (Smart Technologies, 2004).

The first document that I found explaining the IWB features and its use in teaching vocabulary is a learning manual entitled Interactive Technologies in Learning (iTILT) (2011) which was written and published by some European universities and the British Council with the support of the EU Long Life Learning organization. The significance of this manual is that the educational contexts of the manual vary from primary and secondary schools, to vocational colleges and universities. It is divided into four parts; the Introduction in which authors explain the aim of the manual and how its

contents. In the first part of the manual entitled The Interactive Whiteboard authors present general tips on how teachers can make the best use of IWB. In the second section entitled The IWB Based Materials they present the design, evaluation, the implementation, and the copyright issues of IWB based materials. The third part deals with IWB in Modern Foreign Language Teaching. Thus, it is the most important part of this manual because it presents teachers illustrations of the different IWB tools that they can use in teaching speaking, listening, reading, writing and vocabulary. To simplify the illustrations, the manual also provide images of different tasks that are used on IWB.

In the vocabulary section, the manual presents explanation and images of the different vocabulary tasks that teachers can perform using the different IWB tools. It also informs teachers where to find the different materials, images, and which IWB tools to use with each task and how to use them. In addition, having the manual free online means that teachers all around the world can benefit from this document and make the best use of it.

As for the studies that were conducted examining the use of IWB in teaching vocabulary, I found only two studies that focused on researching vocabulary teaching. The first study that examined this area is Katwibun (2014). In her study, the researcher examined the effects of the IWB on teaching vocabulary to 51 students at 11th grade in a high school in the northern region of Thailand. To investigate this issue, she used 3 lesson plans, 3 IWB instructional media packets, post-teaching teacher's note, vocabulary knowledge test, students' participation observation form and attitude questionnaire.

Three steps lesson plans for vocabulary (root, prefix, and suffix) were set; the three steps were presentation, practice and production which were given with three IWB instructional media packets. The observation was conducted by teacher during the classes. Post-teaching teacher's written reflections were provided for the researcher; plus the result of a vocabulary test with 20 multiple choice items which was conducted after learning through IWB and a questionnaire with 8 items with 5 rating scales of attitude was administrated after using the IWB.

The results of the study were positive as the students' vocabulary knowledge was at a very good level as well as students' participation and attitude towards IWB. Although Katwibun presented tables showing the results of the students' vocabulary knowledge, attitude and participation, the study, in my opinion, failed to present enough information and explanation on how the different instruments were used and analyzed. In the discussion and conclusion section, the researcher gives reasons why the results were all at a very good level. She does this by citing and referring to other researchers who reached similar results as her.

Unlike Katwibun's study, Ting et al. (2015) conducted a comprehensive study for the use of IWB in teaching English language and vocabulary to Taiwanese primary students. In this study the researchers used various interactive activities to illustrate the different features of IWB; as well as using different interactive tasks, the researchers also gave the students a pre and post test vocabulary, questionnaire, and interviewed high and low achievers. The study's results confirmed the positive effects of the IWB on the students' learning of the English vocabulary and their attitudes towards the use of the IWB.

The uniqueness of this study in my point of view lies in the way in which these researchers demonstrated their study and the information they provided for other researchers. They demonstrated in tables the different IWB tools that assisted each vocabulary stage and the type of IWB features and correspondent activities. They designed the following table which illustrates the three acquisition stages and the IWB tools that are used in each one.

Acquisition Stage	IWB Tools
Noticing	highlighting using spotlight using magnifier using screen shade
Retrieval	saving the lesson and notes matching images matching key words sorting word categories
Generative Use	annotating writing using infinite cloner

IWB tools that assist each vocabulary learning stage (taken from Ting et al., 2015, p. 44)

As the table shows, in the noticing stage a word is noticed and attention is paid to it as an item to be learned. This is a crucial stage as it affects the extent the word is picked up and learned. Teachers can use the highlighter, the magnifier, the spotlight or the screen shade to emphasize a certain word or a phrase on the IWB. For young learners this is essential especially that their attention span is limited. By using the IWB features teachers are able to direct the young learners' attention to certain words they want them to learn. Teachers can also use these features to emphasis the silent letters

in words and to hide the distraction information by screen shade (Ting et al., 2015 p. 43).

In the Retrieval stage, young learners recall and recognize the words they studied and use them either in similar or different context. This can be challenging as young learners need to recall and use their memory to recognize the words and to distinguish them from other words. For this stage, Ting et al. suggest matching and sorting activities, in which teachers can use IWBs features of drag and drop, hide and reveal, erase and reveal, and layering (ibid, p. 44). In addition to asking pupils to match word with meaning or image, teachers can also ask young learners to match the sound to picture or letters. This according to Pinter (2006) is very crucial as the process of learning how to write is complex and it usually takes time to master; this is because the letters and sounds in English are not direct and consistent. Thus, English is said to have deep language orthography; the spelling of the words does not always correspond with the way they are pronounced or sound. Therefore, young learners are to be taught these irregular sounds at schools so that when they are faced with a piece of writing, they know which letter corresponds with the sound.

Besides their great effects on the young learners' learning of the new vocabulary, IWB features drag and drop, hide and reveal, erase and reveal, and layering activities are games like activities which are liked by young learners thus may affect their participation and willingness to do the tasks on the IWB.

Ting et al. also pointed out that the IWB feature of storing and saving the documents is very useful in instruction as teachers can recall any activity that they have saved from previous periods and any vocabulary they need to practice or memorize.

The third and the final stage is the creative or generative stage which according to the researchers seems to be the aim of vocabulary learning. In this stage young learners have enough vocabulary storage to use effectively for communication and in different contexts. According to Ting et al. table, the IWB features that can be used in this stage are annotating, writing, and infinite cloner. Teachers in this stage can give their students more challenging tasks to assess their knowledge and to encourage them to use what vocabulary they have learnt. They can also ask young learners to come to the IWB and correct their peers' spelling of words or to photograph the students' works and incorporate them into a flipchart to be marked by the whole class.

1.5. Summary

This chapter presented studies that were conducted investigating the effectiveness of the IWB in developing and changing the teaching and the learning process. In its first section which included the introduction, this chapter also gave an overview of CALL that included a brief explanation of the three stages that CALL has gone through from the Behaviorist CALL to the socio-cognitive CALL; the transition that affected the teaching and learning of a language. In the second section of this chapter emphasis was paid to the literature that was written on the impact of the IWBs on pupils. This however looked only at the literature discussing the technology impact on the pupils' learning, achievement, concentration, and perception. The third section discussed the use of the IWBs in primary education and presented an extensive demonstration of the most prominent studies investigating the use of IWB in primary teaching and learning. The final section provided an illustration of the literature and the

studies that investigated the use of IWBs in teaching vocabulary and the IWBs features that can be used to teach vocabulary to young learners.

CHAPTER II

KING HAMAD SCHOOLS OF THE FUTURE PROJECT

This chapter presents the reader with a brief history of education in Bahrain and an account of the English language teaching in primary stage and its position in the educational system in the country. The chapter will also present an extensive description of King Hamad Schools of the Future Project which started the technological employment of the interactive whiteboard (IWB) in Bahrain. Previously I have worked as an English teacher and as a senior teacher at a high school thus I am familiar with the way that the Ministry of Education in Bahrain organizes the introduction of a new scheme and the way it runs the training session. However, I have never taught at a primary school or with IWB but I have attended some classes when the technology was first introduced in some schools therefore I am aware of King Hamad Project and how it started and how the second step of the project i.e. digital learning is gradually being put into force in the different schools.

2. 1. Introduction

Education in Bahrain dates back to the early 20th century when Bahrain opened its first government school for boys in 1919 Al hidaya AlKhalifia Boys School in Muharraq. In 1926, the Education Committee opened the second government school for boys and, in 1928; the first government school for girls was opened.

Education in Bahrain is compulsory, and all 6 years old children must attend either government or private schools. Basic education is divided into two stages: primary and intermediate stage. Primary stage consists on six years and accommodate pupils of age group 6-11. Intermediate stage accommodates pupils of age group 12 - 14, and lasts for three years. The final stage is the secondary stage which accommodates pupils of age group 15 - 17; the duration of study is three years, which is divided into six semesters (three levels)

2. 2. English Language teaching in primary government schools:

English is one of the major compulsory school subjects in Bahrain government schools in all the three educational stages from the first primary to the third secondary. It is also considered the second language in Bahrain and almost all people are expected to be able to communicate in English in addition to Arabic; though in some financial and technical establishments English is considered the language of communication.

Teaching English in government schools goes back to the foundation of the first government school in Bahrain Al hidaya AlKhalifia Boys School in 1919 (Syllabus for English Language, Syllabus for Basic Education manifesto, 2005, p. 5); until the end of 1999-2000 academic year, English teaching started in Year 3 or Year 4 of primary and continued to the secondary schooling, making it 9 years in total. However, at the beginning of the academic year 2000-2001, the Ministry decided to introduce English experimentally in Year 3 and at the beginning of the academic year 2004-2005, English was introduced in a few number of schools from Year 1. In the following year all primary government schools started teaching the language from this stage (ibid).

According to the manifesto for English Language Syllabus for Basic Education (2005) parents, teachers, pupils and government officials who were interviewed supported teaching the language from Year 1. They argued that this will enable the learners to do the following:

- "Provide more opportunities for the learners' to communicate with other people from other language groups.
- Increase the learners' awareness and insight into the culture of native speakers of English and the language linguistic diversity.
- Access a wider range of educational opportunities in the future.
- Enhance L1 abilities and thus develop 'cognitive functioning', 'divergent thinking', and 'metalinguistic' proficiency.
- Develop an understanding and appreciation of the difference between Arabic and English languages and cultures; consequently developing an understanding and an appreciation of their own language and culture." (p. 7)

The primary classes are mixed ability and class size varies from around 25 to 35 in some cases. The teaching materials for all schools and all levels are selected by the Ministry of Education; teachers are encouraged to supplement the set materials with materials that correspond with the pupils' needs, level, and interests. The number of the teaching periods of English language is the same from Year 1 to 9.

At the end of basic education cycle, pupils must be able to:

- "Use English indifferent situations and for different purposes (Application)
- Use English effectively and efficiently (Language Competence)

- Employ strategies to increase their learning and communication(Strategies)
- Apply the knowledge, skills and attitude to become an effective 'global citizens' (Global Citizenship)" (Syllabus for Basic Education manifesto 2005, p. 16) (Appendix 1 for full illustration of the outcome)

A committee from English language specialists in the Ministry of Education and specialists from the publishers select the textbooks for all stages. These books are selected from well-known British publishers such as Oxford University Press and Pearson Longman and are changed every five or six years. Though, sometimes the Ministry of Education continues teaching the same books for 10 years. This however occurs for financial reasons and if the Ministry of Education had good feedback and recommendations from primary teachers and pupils.

Bahrain has one of the most developed education systems in the Gulf, in 2003 made great progress in the use of information technology (ICT) in schools hence King Hamad Schools of the Future Project. This project aims to connect and link all schools within the kingdom of internet and introduce the idea of education everywhere.

2. 3. King Hamad Schools of the Future Project

With the incessant changes in teaching methods, learning has become the most important issue facing societies. This is because teachers are faced with a new technological revolution which they need to learn, adapt and to use in their teaching in order to attain the interests of their pupils who are dealing with technology on a daily basis and who are no longer interested in the conventional way of teaching. Pupils today expect their teachers and schools to use state of the art ICT equipment and their

teachers to be ICT literate. To meet these expectations, teachers and educators are continuously searching and developing new methods of teaching and inventing new ICT tools which would enable them to benefit from new technologies such as the internet and new software in their lessons. Mitchel Resnik indicates that in order for us to fully benefit from new technology "we need to fundamentally rethink our approach to learning and education-and our ideas of how technology can support them" (2001, pp.45-46).

Having realised this fact, in 2001 the Ministry of Education in the Kingdom of Bahrain decided to put a clear strategic plan to employ and introduce ICT in education and so in May 2002 a team of ICT specialist and educators met and produced a future plan which included a Focal Point that covered the use of ICT in all aspect of education. This resulted the launching of King Hamad's Schools of the Future Project in 2005 which aimed to use interactive whiteboard (IWB) in all government schools. The Ministry laid down four general goals for this project aiming at:

- Developing the educational system in the Kingdom of Bahrain and elevating its products.
- Accelerating the pace of human development.
- Establishing an Information Society.
- Building a Knowledge-Based Economy.

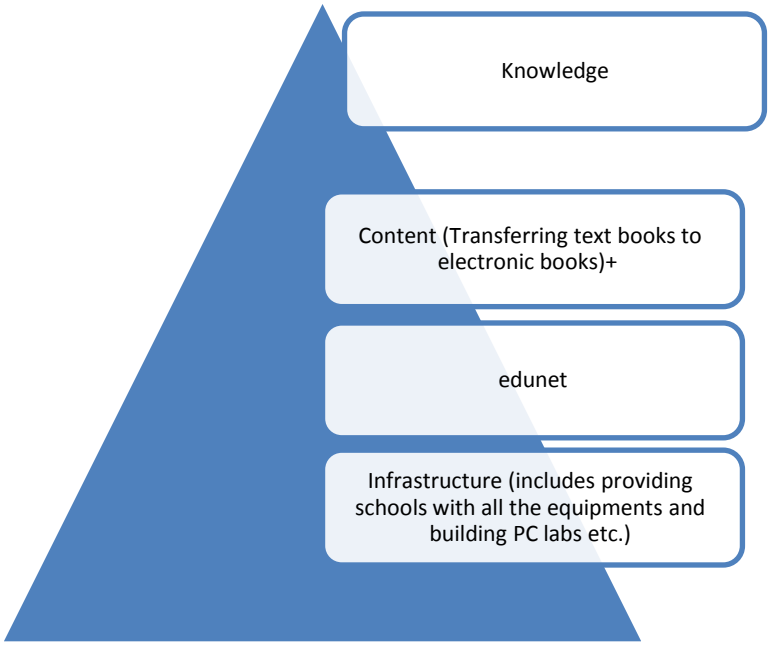
As for the learners the Ministry aimed to establish these goals:

- Providing the excitement factor in teaching and learning and making learning an enjoyable experience.

- Gradually presenting pupils activities and tasks which are parallel with their cognitive level and their needs.
- Simplifying the transformation of knowledge to pupils.
- Enabling autonomous learning.
- Enabling easy contact between the teachers, pupils, parents, and schools administrations.
- Enhance academic achievement for pupils with special need who were placed in schools with other pupils.

2:1 Image of a primary student using IWB.

In order to fulfil the Project's goals, the ministry illustrated the different stages that will enable it to fulfil its objectives:



2:2 Image shows the steps for King Hamad Project

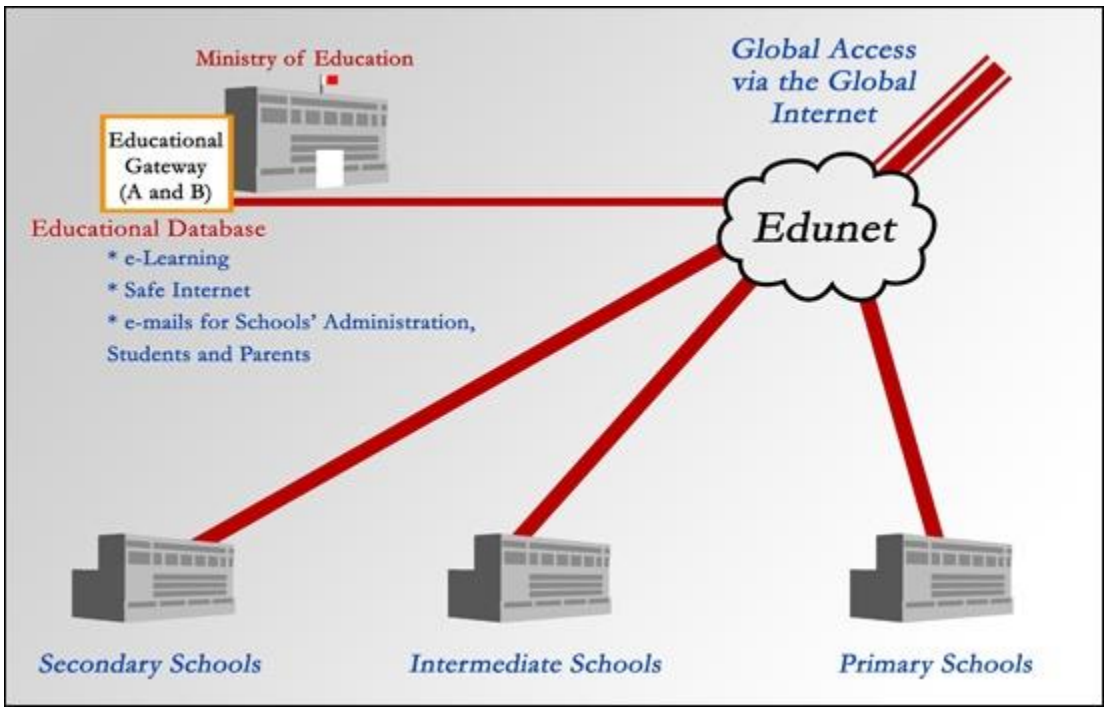
As the diagram shows, at the first stage schools are provided with IWBs in their classrooms; in primary and intermediate schools all the classrooms are equipped with the technology; however, in secondary schools, only two or three classrooms in each school are turned into electronic classrooms with thirty computers linked to a fixed IWB. Electronic labs were also installed in schools.In the second stage, the Ministry with the assistance of Bahrain Telecommunication Company developed a network and an internet system that connects schools and the Ministry with two data centres: site A which is the major site and site B which is the backup data centre that is used when users face some technical problems accessing site A.

2.3.1 The project stages

The project had two stages: the planning stage which was called (Master Plan 1); the development stage (Master Plan 2).

2.3.1.1. Master Plan 1 (2005-2010)

For this stage the Ministry had a five year plan. First, the Ministry connected all the participating parties with internet as the following diagram illustrates



2:3 Image shows King Hamad School of the Future operations

As shown in the diagram, the Ministry of Education and all schools are connected to data base which is referred to as Educational Gateway. It provides internet to all parties who are connected in the teaching and learning process including parents who

have unlimited access to their children's progress reports and a direct communication with teachers and administrators. Parents can link and check their children's progress and their homework, and at the end of the year they can know their children's results. They can also communicate with their children's teachers and school administration to talk about their children' levels, grades, and any other matters they are concerned about. Pupils can also log on to their page and communicate with their teachers, their peers and examine and use the different resources for their subjects.

During this stage the Ministry had also developed training sessions for all the teachers and schools administrations. Lab technicians were also trained and the number of them was increased in all school. An annual Technology Excellence Award in Education was also introduced to encourage teachers and pupils to produce or create programs or websites that would help in enhancing the learning process. Technology education specialists visited the different schools regularly to monitor and help any teachers and observe the teachers' use of the IWB and their interaction with their pupils in electronic classrooms. During the first plan, the number of schools joining the project was increasing every year as the following table shows:

Stage1 (2005)	Stage 2 (2006)	Stage 3 (2007)	Stage 4 (2008)	Stage 5 (2009)
11 schools	41 schools	41 schools	61 schools	61 schools

Table 2.1: The different stages of King Hamad Project and the number schools in each year

2.3.1.2. Master Plan 2 (2011-2016)

In 2010 at the end of Master Plan 1, 61 schools joined the program; and during Master Plan 2 the number of schools continued to rise and in 2011 in an interview to AlAyam Newspaper (2011) the Minister of Education Dr. Majad Al Naimi announced that all government schools are within the project. However, as it was mentioned earlier not all schools were fully equipped with IWB; secondary schools were only equipped with two or three electronic classrooms. In this stage the Ministry also used the term e-schools instead of the term e-class to mirror the development and innovation in education in Bahrain. Certain goals were set for this stage:

- Expanding the employment of ICT by focusing on providing a national content and high quality specifications according to international standards and dimensions
- Introduction of the program ICT Mentoring Program which aims to follow up the utilization of electronic teaching in schools.
- Developing a learning management system to support and reinforce Educational Portal of King Hamad Schools of the Future Project.
- The employment of ICT strategic plan in line with the Ministry general strategic plan which aims to enhance and improve the educational outputs of King Hamad Schools of the Future Project.
- To continue improving the performance of educational network.
- Promote the use of e-learning among teachers and pupils and support their creativity and cooperation.

- Increase the awareness and dissemination of electronic culture in society.
- Support and promote scientific research in the field of e-learning and ICT and continuously consult experts and consultants in this field to cooperate and exchange experiences. (AlDhib et al. 2012, pp. 84-85)

In terms of electronic content, the plan consisted of purchasing and developing electronic content which would renovate education in Bahrain. To fulfil this, a 'electronic content team' was formed who communicate, studies, and evaluate all the various companies' products such as Software-Authoring Tools; Virtual labs for chemistry and physics; Autograph and Crocodile software for mathematics and educational games. Plus purchasing the different software, the team is also responsible for developing in house materials.

The educational network had also a plan to develop the central data centre and provide more servers for schools and the ministry together with renovating a backup data centre. The educational network also worked on providing the schools' servers with different applications such as the learning management system (ITWORX Company) and all educational multimedia files. It also activated the educational system services Eduwave and is studying the development of a website for arbitration according to the international standards of WSA. Te enable smooth communication between the different parties, all teachers, pupils, and their parents were provided with emails. Schools' administrations and teachers were also given the opportunities to video conferencing any schools in the world and to create virtual classrooms, and different cyber channels (AlDhib, et al. 2012, p. 86).

In 2015, the Ministry started the second phase of the project which called Digital Empowerment in Education or 1:1 learning-mobile learning.

2.4. Digital Empowerment in Education

Having reached the final stages of King Hamad Schools of the Future Projects, in September 2015 the Ministry of Education introduced Digital Empowerment in Education or 1:1 learning-mobile learning. The project aims to empower pupils to be

a. Productive & lifelong learners
b. Prepared for the Digital life in Smart Society (E-Inclusion for All Citizens)
c. Citizens with better opportunities to live with quality and happiness.

In line with the ministry's plans, the Ministry chose 5 intermediate schools to commence this project and provided all the pupils of these schools with either personal tablets or PC which had all their different subjects textbooks installed on them. In September 2016 the number of participating schools increased making the total number of participating schools 12. As this project reflects the completion of King Hamad Schools of the Future Project, Digital Empowerment in Education shares similar same and vision as King Hamad's Schools of the Future Projects**.** The Ministry has also ran different training programs as the following table shows:

Category	No of training programs	No of training hours	No of trainees
School Principals	35	525	454
Technology Specialists	510	2278	4391
Teachers	341	1877	17007
Pupils	88	932	26351
Educational specialists	71	876	858
Technicians	65	351	173
Others	25	450	55

Table 2.2: The training programs' statistics.

The training session as the above table shows does not only include schools' principles, technology specialist, teachers, educational specialist and technician but also students. These were trained on how to use and integrate technology with teaching in line with the criteria set by International Educational Technology Standard (ISTE). The participants in the training sessions including students were trained on how to use teaching applications on desktop and lap top computers, mobile phone and IWB. The trainees with the students were also trained on how to use the Educational Gateway (Edunet) set by the Ministry of Education and how to connect and make web conferencing with teachers and students all over the world. School principals, teachers, and students were also trained on how to communicate live or via email with each other and parents of the students were given user names and passwords to log in to the Edunet and communicate with their children's teachers and schools' principles. Of course as more new schools join the digital learning scheme every year, these training sessions will be run again to ensure that all the new participating parties are well trained.

2:4 Image depicting teachers in a training session learning how to integrate the different technological devices in teaching.

2:5 Image shows schools principals during training session.

2.5. Summary

This chapter provided the reader with a brief history of education in Bahrain and the different educational stages in all government schools and a look at the English language teaching in primary education. It also presented a through description of King Hamad Schools of the Future Project which revolutionised the teaching and the learning process in all government schools in Bahrain starting with the installation of IWB in all schools.

The next chapter will introduce research design and methodology. It will give an illustration of the methodology in this study and the rational for using each qualitative and quantitative method. It will also introduce the participants and the setting of the study. In addition, it will present an explanation of the data collections methods and the different research tools that will be used and the reasons behind their selection. Finally, the chapter will also discuss the issues of validity and reliability of the study.

CHAPTER III

RESEARCH DESIGN AND METHODOLOGY

3.1 Introduction

This chapter illustrates the research aims and questions and introduces the readers to the participants and the setting of the study. It also explains the methodology adopted in this study and illustrates the theoretical framework of the study. Moreover, the chapter gives a detailed description of the research design and a detailed description of the data collection; it explains the data analysis methods and offers evidence to illustrate the validity and reliability of this study.

3.2 Research aims and questions

The general aim of the study was to investigate the relationship between Year 5 English vocabulary achievement and the use of IWB in the four selected schools. The study also investigated whether the use of IWB in class changed the classroom atmosphere and the pupils' aspiration to study English and their interactions between each other and their teachers. The questions that this study will answer are stated as follow:

- *What attitude and perception do the pupils hold towards the use of IWB in their learning?*
- *What effects does the use of IWBs have on pupils' participation and interaction when learning new vocabulary?*
- *What is the effect of IWB's use in teaching the new vocabulary on the children's vocabulary achievements?*

3.3. Research Paradigm

It was essential to determine a conceptual framework for the study; this, as Silverman (2001) stated, explains the researcher's paradigmatic viewpoint therefore reflecting his or her philosophical perspective of the world. It also, as Silverman pointed out, helps in guiding the researcher to an informed research methodology and design from which the research questions can be tackled.

Due to the nature of the study, this study had been conceived within the pragmatic research. The pragmatic paradigm was chosen because it allowed mixed methods approach and was suitable for the study's questions. Many pragmatists argue that the first step a researcher must do is to look at the research questions to determine their research framework. Creswell (2003) argued that within a pragmatic paradigm, choice of methods depends directly on the purpose of and the nature of the research questions. Researchers can examine what works with their research questions and address those which do not fall completely within quantitative or qualitative approach. The pragmatic paradigm allows the researcher to study areas that are of interests and to adopt methods that are suitable and to use findings that are in accord with the value system of the researcher (Creswell, 2003).

Darlington et al. (2002) emphasised the same issue and pointed out that choosing a quantitative or qualitative approach does not rely on a philosophical commitment but on a belief that a design and a methodology suits the aim and purpose of the research.

Scandura et al. (2000) argued that any research method researchers choose has flaws and choosing a method will definitely limit the conclusions that will be derived

from. Therefore, it is important to use supporting evidence which are derived from mixed methods to achieve validity. Pansiri (2005) stated that this is called “triangulation of methods” (p.199) which is not something new as it was defined by Denzin in 1970 as “the combination of methodologies in the study of the same phenomenon” (cited by Pansiri, 2005, p. 199).

Some researchers such as Casti (1994) and Sedgwick (1993) argued that the pragmatic paradigm is the one method that is capable of handling different characteristics and features of modern society and technology. Tashakkori et al. (2003) commented that there are three areas where a mixed method is superior to other methods approach; first, mixed method is able to answer and respond to research questions that other approaches are unable to do such as simultaneously confirmatory and exploratory questions; also by answering complex social phenomena, mixed methods presents the researcher stronger inferences; and finally it offers researchers an opportunity to offer or illustrate different perspectives for their various findings.

In addition, the pragmatism had several features that seemed to be logical and in tune with this research. One of these features was that pragmatism “endorses eclecticism and pluralism” (Johnson et al., 2004, p. 18) such as “observation, experience, and experiments [that] are all useful ways to gain an understanding of people and the world” (ibid) Another feature that was felt was in tune with this study is that pragmatism appreciates “the reality and influence of the inner world of human experience in action” (ibid); and knowledge is formed and sprung from the reality of the world people experience and live in (ibid).

Accordingly, the methodology of this study was underlined by investigating the experience of the participants on the use of IWB in the classrooms and its efficiency in developing their attainment of English vocabularies; plus portraying how these were represented and interpreted. Not forgetting that these interpretations were unique as they were related to these selected participants hence could not be generalised as almost all classroom's scenario.

As for the data analysis, the researchers need to comprehend the social phenomena and interpret the data to clarify the meanings and to describe the complete picture (Schwandt, 1994). To do so, researchers need to translate and focus on the social construction of the reality which is based on the participants' interpretation of their reality, plus their own interpretation of the same reality and to mutually create the data. This as Guba and Lincoln (1986) pointed out, demands that the researchers build the findings in the informants' constructions of reality to reach a mutual construction.

Yet, this may highlight the issues of objectivity and subjectivity in qualitative research. Mellon (1990) affirmed that objective researchers try to eradicate bias while subjective researchers acknowledge it. He argued that it is impossible for researchers to achieve total objectivity because they are human beings so "naturalistic researchers systematically acknowledge and document their biases rather than striving to rise above them." (p. 26).

Whilst in quantitative research the credibility element relies on the instruments construction, in qualitative research "the researcher is the instrument" (Patton, 2001, p. 14). Richards (2003) explained that Ethnography fits perfectly with the description of qualitative research as "it seeks to describe and understand the behaviour of a

particular social or cultural group. In order to do this, researchers try to see things from the perspective of members of the group and this requires extended exposure to the field." (p. 14). He argued that the researchers must negotiate entry into the research field as a participant observer which would enable them to move from being an outsider to being an insider, although the goal of this is not to become a complete insider to avoid being affected by all the beliefs, attitudes and routines that the researchers need to be detached from (Richards, 2003).

This means that the credibility of the qualitative research depends on the integrity and the ability of the researcher to interpret and to develop a unique perception and critical interpretation of the context being investigated. According to Merriam (1998), the qualitative investigator's credibility, deals with how much of the research's findings match with reality and how much of the results of the research are credible or believable from the perspective of the participant in the research. Consequently, the credibility criteria involve establishing that the results of qualitative research are credible from the participants study perspective. This can be achieved by employing certain techniques and by using different research instruments to collect and analyze data. In this study, the pragmatic paradigm was used which enabled the researcher to use a combination of quantitative and qualitative methods. This was done to cover the study's questions and to ensure getting data that reflects both the pupils' feelings and attitudes towards learning English through IWB and how this interpreted in their achievements tests.

3.4. Research design

As it was mentioned earlier, this study is a mixture of quantitative and qualitative methodology; the quantitative inquiry was used in the analysis of the questionnaire which addressed the learners' opinions on the use of IWB in learning English. The decision to use such an instrument was due to the fact that this instrument enabled the researcher to collect data from large number of pupils who would normally present different responses. Questionnaires "are very useful devices for the researcher, as they build a degree of sensitivity and differentiation of response" (Cohen et al, 2007, p. 325). Quantitative inquiry was also used to address the research question regarding the effects of IWB on the learners' achievement. For this, an analysis of the learners' test results was carried out; another analysis was also carried out on a previous vocabulary test which the pupils took in Year 4 and was designed under the supervision of English language supervisors and senior primary teachers.

The decision to use observations was because as a method, observation is useful for a researcher in many ways. DeWalt et al (2002) pointed out that observation as a method "develop a holistic understanding of the phenomena under study that is as objective and accurate as possible given the limitation of the method" (p. 92). It allows the researcher to enter the world of the participants hence validating and understanding the responses to the questions on the questionnaire and the achievement test. Observation also "opens up possibilities for encountering the completely unexpected phenomenon that may be more significant than anything the field worker could have foreseen, suggesting important hypotheses worthy of further study" (Whyte, 1984, p. 27). When researchers negotiate their entry to the chosen setting and gain acceptance

and become participant observers, they gain access to valuable and interesting information. According to Adler et al. (1994), participant observation “enjoys the advantage of drawing the observer into the phenomenological complexity of the world, where connections, correlations, and causes can be witnessed as and how they unfold” (p. 378); this complexity as Richards (2003) said, makes participant observation the most challenging and the most involved method in qualitative inquiry. However, he argued, that it commands engagement which needs to be carefully negotiated with the other people involved in the study.

Some researchers have also claimed that a teacher's academic attitude, personality, habits and emotional reaction affect the pupils’ academic success, interests and even their personality (Jeans, 1995; Brooks et al., 1997). Thus, the researcher chose observation to capture the teacher’s influence on her pupils. Observation was also used because it enables the researcher to examine what is happening in the classroom. It also describes the current status of instructional practices and identifies instructional problems. As Good et al (1988) put it, "one role of observational research is to describe what takes place in classrooms in order to delineate the complex practical issues that confront practitioners" (p. 337).

Consequently, the researcher’s observation of the classrooms and her communication with the teachers throughout the study was an essential element to achieve an effective inquiry. Moreover, the relationship that the researcher was able to create with the participating teachers and the schools’ administration has enabled her to explain the study’s goals and instruments to the participants and to assure them the confidentiality of the results. This has formed a mutual understanding between the

researcher and the participants and created a close friendly atmosphere. Lincoln et al. (1985) suggested that prolonged engagement and intensive contact with the phenomena and persistent observation achieve internal validity of a study.

3.5. Data collection method

In order to achieve a deeper understanding of the research problem in its unique context (Ulin et al., 2004) three research tools were used: test, questionnaire, and observation; these will be illustrated in the next sections.

3.5.1. Tests

Read (2000) mentions three dimensions for vocabulary assessment which he argued represent ways in which teachers, researchers etc. can expand their typical ideas regarding what a vocabulary test is. The first of these dimensions is the 'discrete-embedded'; according to Read a discrete test considers vocabulary knowledge as a distinct construct, separated from all other language proficiency components. He argued that most of the existing vocabulary tests are designed to test vocabulary as an independent construct and thus can be classified as discrete measure. In contrast, an embedded vocabulary measure as Read defined it "is one that contributes to the assessments of a larger construct" (p. 9). He states that such measure is found in reading tasks consisting of a written text followed by comprehension questions. In these kinds of tests, he said, it is common to find number of items assessing the learners' understanding of a special words or phrases in the text, however the scores of the

vocabulary item are not counted separately making them part of measuring the learners' reading comprehension ability and not their lexical comprehension (ibid).

However, Read illustrated that the difference between discrete—embedded does not primarily refer to the way vocabulary presented to the test-takers; what makes the tests discrete is the focus on the construct of vocabulary knowledge. Read argued that a test can include words in a large of context and still be discrete; for instance, a person can take a suitable reading text, select a number of the words or phrases and write multiple items for each of the words that is designed to assess the learner's understanding of the vocabulary meaning in the text. In this situation, the teacher can interpret the test's scores as measuring how well the learner can understand the meaning of the words and phrases. Therefore, as Read explained, what determines if a particular vocabulary measure is discrete or embedded is the aim of the test and the way the results are interpreted (pp.9-10).

The second dimension is 'selective-comprehensive dimension' which deals with the range of vocabulary that is included in the assessment. Read explained that in a traditional vocabulary test, the test is based on a set of words that the test writer selects and the test-takers are evaluated according to how well they know these words. He called this kind of test 'selective vocabulary measure'. In this test, test-writers may first select individual words and then incorporate them into separate test items, or choose first an appropriate text from which they choose certain words as basis for the vocabulary assessment. In contrast, Read explained that a comprehensive measure considers all the vocabulary content in a spoken or written test. It can also be applied to the input materials for a reading and listening tests (p.10).

The third dimension is the ‘context-independent verses context-dependent’. As the title suggests, in this dimension, the context is the basis of the vocabulary testing. Although contextualization meant that a word in a test is presented in a sentence rather than in isolation, from contemporary point of view, as Read explained, it is important to broaden this perspective of context to include the whole text including discourse; context must be recognized more than just a way in which words are presented. He examined the test-takers assessment and their engagement with the context and questions if they can provide an appropriate response to the test without making use of the contextual information i.e. looking at the words as if they were in isolation and not in the context.

Read argued that in a reading comprehension question where the test takers are asked to give the meaning of a word in a text and are given options of four meanings, test takers need some understanding of the context in order to choose the correct answer rather than relying on their knowledge of the meaning of the word. He said that the issue of context dependence also arises with cloze tests, in which words are systematically deleted from the text and test takers are required to provide the missing words by looking at the immediate context of the blank or by drawing information from the wider context of the passage (pp.11-12).

3.5.1.1. The study’s assessment test

The pupils in Bahrain primary schools are required to learn new English vocabulary each year. Accordingly, the number of words in each year increases as the child gets older. This is in harmony with the development of their cognitive abilities. For

instance, in Year 1, the pupils are required to learn 30 new English words, but this number increases with every year of study. When the pupils reach Year 5, they are required to learn 100 new words.

When designing the test vocabulary (Appendix 2), I looked at the pupils' textbook in which the units are topic based and chose words from the units which all the pupils covered in the first three months and in the second term of the academic year. By doing this, I made sure to test the pupils' knowledge and recognition of words they studied in the first term and in the second term. It was decided to test the pupils in the unit which deals with hobbies because it was felt that it is a topic which is frequently used by Arab pupils when they are asked to talk about themselves. As a teacher of English language, I have noticed that Arab pupils in all academic levels feel that talking about their hobbies is an expression of their personality; even in the university when pupils are asked to talk about themselves they often mention their hobbies. I realize that asking the pupils in the second question to write the names of the hobbies may reflect my subjectivity but as it was argued, this seems to be an important topic for the Arab pupils.

Besides selecting the hobbies vocabulary, I also relied on the teachers' recommendation. I discussed with one of the participating teachers the process in which she and the other teachers follow to choose the words they wanted to emphasize and dictate every week. She presented me the teacher's guide which, at the beginning of each unit, presents teachers with the new words they need to target and dictate each week; also the new words which pupils need to be learn through practice and speaking but are not obliged to know or memories the spelling. Based on the writers' and teacher's recommendation, for the first question of the test, I chose words which pupils

were required to know and were among the 100 words the pupils needed to know the spelling.

In order to ensure objectivity, Microsoft Excel was used to choose the words randomly that would be used in the test. Words from all the covered units were put in Microsoft Excel program and the six highest valued words were chosen and included in the first section of the test. The same procedure was conducted for the second question. However, as mentioned earlier, this question included only vocabulary related to hobbies.

The assessment test which was used for the study was a discrete test; words were treated as an independent construct, separated from other components of language thus the vocabulary knowledge receives an independent score. The aim of the test was also in accordance with the discrete test function which was used by the teachers when they wanted to monitor their pupils' progress regarding words presented in the class over period of time.

The test was also child friendly and designed in a simple and familiar way appropriate to the pupils' age, ability, experience and knowledge (Shepard, 1994). The questions were presented in a familiar format as the pupils had worked on in their textbooks and workbooks. The questions also relied heavily on pictures; this was because "for children under 11, visual stimuli can be especially useful in the questioning process, because pictures make the issue far more concrete than verbal representation alone" (Scott, 1999, p. 102).

The first section of the test (appendix 2, section A) assessed the pupils' receptive vocabulary knowledge as they were given six words which they had to understand by

looking, recognizing and associating each word with the matching picture and then writing it below the picture. The vocabulary in section A was different where three of the words consisted of a one word: ‘cereal’, ‘upset’ and ‘toothache’ and the other three words consisted of collocation of words: ‘curly hair’, ‘ride a bike’ and ‘brush teeth’. These were tested in this manner because this was the way in which they are presented in the pupils’ textbook and taught to them by their teacher.

In contrast, section B of the test assessed the pupils’ productive vocabulary knowledge. The pupils were given pictures representing hobbies that they had already studied as part of their curriculum and they had to recall the hobbies’ names. For instance, the first picture of section B showed a little boy drawing which indicated the hobby ‘drawing’; and the final picture showed a girl sitting on the ground holding a plant and patting the soil which indicated the hobby ‘gardening’**.** Pupils had to look at the picture and come up with the name of the hobby and write it below each picture. Thus, this question was similar to the previous one but unlike the previous one, it challenged the pupils to recall and to write correctly the name of each hobby, hence testing their recognition of each hobby and the spelling of the word.

Although these words were less commonly used than hobbies such as playing football or watching television, the teachers assured me that the pupils had already used these words in various tasks. Like the previous question, the design of this question was incompliance with the design of the activities that the pupils had in their textbook and the selected words were among the words that they needed to know the spelling of and would be tested on.

The data were compared and analysed. This included the comparison of Group BG (girls) and Group CB (boys) who were not taught by IWB, and Group ABIWB (group A boys with IWB) and Group DGIWB (group D girls with IWB) who were taught by IWB on a daily basis. The result of Year 5 test was then analysed against a vocabulary test which the pupils took in their final year in Year 4 and was designed and prepared by English language primary curriculum specialist at the Ministry of Education. The significance of doing such analysis is to examine and analyse a test result during which all four groups were taught by IWB, hence making their learning environment similar.

3.5.2. Questionnaire

Conducting a research has always been a common method to collect and investigate social phenomena and issues, but only during the past forty years the social researchers have come to acknowledge the importance of conducting survey research with children directly, rather than relying on the findings of qualitative research and prevalence data collected by proxy from adults (Scott, 1997). Many statistical specialists such as Bell (2007) and De Leeuw (2011) agreed that survey research is feasible with children from the age 7, though with carefully adapted questionnaires. This is because children from the age of 7 onwards have a major developmental point in their cognitive and social maturation. Nevertheless, any questionnaire for these children must be carefully structured. However, for children from age 11, the questionnaire's adaptation is reduced; as for teenagers aged 16 onward, they would be expected to answer adult questionnaires (Scott, 1997).

Yet, a researcher must be aware that not all children have the same opportunities in life and that these studies which resolved that age 7 is possible are conducted in western countries where the majority of children are privileged; but in other parts of the world, 7 years old children may be living in less privileged circumstances (lack of schooling, malnutrition etc.) that may slow down their cognitive development making them inappropriate for participating in or a study.

Some researchers are also concerned whether children have the cognitive, communicative and social skills necessary for providing 'good quality' responses to survey questions as Bell (2007) pointed out that Piaget's theory of child development showed how elements related to language, literacy, and memory continue to develop during childhood affecting children's ability to answer the survey questions (p. 462); children cognitive ability may also be affected by the context and the content of the questions such as having difficult or unfamiliar vocabulary.

During the last few years the knowledge on the interrelationship between the effects of the reduced cognitive ability and the response reliability has increased, and several studies such as Alwin et al. (1991) and Knauper et al. (1997) have shown that decrease in cognitive functioning is associated with a decrease in reliability response. Growing up involves changes in cognitive functioning changes such as the cognitive ability and the communicative and social skills in children continue to develop making these vary across the children. These differences can lead to the use of different strategies in answering questions and consequently to differences in the reliability of responses obtained in surveys of children and young adolescents. However, as Bell explained there are some principles that can help researchers designing a child-friendly

questionnaire that would enable them to produce appropriate and effective questions for children; for instance the questions length and wording; as Bell explained “simplicity is the key to designing good questionnaires for children, so in general it is advisable to stick to short questions with straightforward syntax” (p.463). In addition, researchers must also use simple structure which means avoiding questions with a difficult structure, such as those which are “double-barrelled or hypothetical” (Ibid) which are most likely to cause problems for children; also questions with negative formation must be avoided as they tend to make the respondent responds negatively. Caution must be taken to the number and ordering of response options. It is better to limit the number of options as well as paying attention to the ordering of responses for both adults and children as they “have a tendency to select the options that appear nearer the top of the list, either because they are unmotivated to read all the way down or because the earlier options persist more strongly in memory” (Bell, 2007, p. 465).

3.5.2.1. Questionnaire design

By considering children’s development theories, certain factors were considered when designing the questionnaire (Appendix 3) for the pupils as their ages were between 8 and 10 years old. To begin with great care was also given to the syntax, vocabulary of the questionnaire. In addition, focus was on the clarity and the length of the questions. This is because studies showed that “children have an extremely low threshold for ambiguity and vagueness in questions and cannot cope with it” (De Leeuw, 2011, p. 13). In this questionnaire, I also avoided phrasing the questions in a

negative way because this would affect the pupils' response as was discussed by Bell in the previous section.

The questions were also designed in accordance with the various studies that supported the positive impact of IWB on pupils' learning, motivation and attitude towards learning. To clarify this point further, the following table which shows the questionnaire's questions and the rational and few of the studies supporting these questions was designed. Some of these studies supported all the ideas that the questions were tackling with regard to the application of IWB and its effects on the learning in general and the pupils' attitudes but I decided to put them either with the rational regarding the first set of the questions or the second set of the questions.

Questionnaire questions	Rational for asking these questions.	Studies/literature supporting these questions.
1. I learn more when my teacher uses the interactive whiteboard	This question was asked because some studies have proven that student's learning improves with the use of interactive whiteboard.	1. Higgins et al. (2005) study found that interactive whiteboard "can be effective tools for initiating and facilitating the learning process, especially where pupils participation and use of the board is utilized."(p. 866). 2. Other study supporting this point is Glover et al. (2007)
2. I understand the lesson when my teacher uses pictures, videos and sounds on interactive whiteboard	It is known that children love the use of pictures and multimedia in the classroom. They love listening to songs, watching videos and	1. Holmes (2009) found that interactive whiteboard enhances understanding. 2. Higgins et al. (2005) study has

	using different colors and pictures. Thus when teachers use the multimedia tools and facilities provided by interactive whiteboard, they attain and capture the children's attention and present the elements of enjoyment to the learning process and the classroom.	reached similar results in their study A 10 year old girl who participant in their study said "that the pictures help you understand what the teacher is talking about"(p. 860). 3. Millington (2011) found that "songs can be used as a valuable teaching and learning tool. Using songs can help learners improve their listening skills and pronunciation; they can also be useful for teaching vocabulary and sentence structure" (p. 140).
3. I concentrate more when my teacher uses interactive whiteboard.	The word "concentrate" was used here to emphasize the role the interactive whiteboard has on capturing the attention of the child; especially as it is a known fact that a child's concentration span is short. Therefore, teachers need to use something interesting for the child to attain the child's concentration, and Studies have shown that interactive whiteboard succeeded in doing this.	1. Amolo et al. (2007) found that "students overwhelmingly indicated their excitement for using the interactive whiteboard. This translated into an increased attention span for many. Many students wrote how the features and content of the lesson made them want to pay attention and want to learn materials being presented"(p.7). 2. Other study illustrated similar results is Glover et al. (2007).

4. I participate more with my teacher and the class when my teacher uses interactive Whiteboard.	The children were asked this question because there are various studies suggested that the implication of interactive whiteboard increases the students' interactions and participation with the teacher and with other classmates. The word "participate" was used because it suggests that they are concentrating with the teacher and it also implies mental, verbal, and physical interaction between the students themselves and their teacher.	1. Gérard, et al. (1999) found that using interactive whiteboard "supports interaction and conversation in the classroom. It helps with the presentation of new cultural and linguistic elements" (p. 2). 2. Beeland (2002) the study's survey showed that interactive whiteboard can be used in the classroom to increase pupils' engagement during the learning process.
5. I enjoy learning when interactive whiteboard is used.	This question was asked because unless children enjoy learning, they will not be motivated to listen, concentrate and participate with the teacher. Enjoyment is an important factor in teaching young learners.	1. Amolo et al. (2007) study also emphasized the element of enjoyment that the students have when using interactive whiteboard as one pupil commented that "it was so much fun and the lessons were so cool it didn't even feel like learning" (p.4).

6. I prefer learning lessons that are taught with interactive whiteboard.	This question tackles the children's preference and gives them the opportunities to express what they favor their teacher to use when teaching them.	1. Pupils in Levy's (2002) reported that with the use of interactive whiteboard their lessons are faster paced, more fun and exciting, and that they were eager and interested to see what would appear next on the board.
7. I am happy when I use interactive whiteboard.	Similar to the previous question, this question reveals the children's feelings when they are asked to use the board thus giving teachers a glance of what makes the children happy in a classroom.	1. Children in Sylvie's study (2004) expressed their delight when using the interactive whiteboard. During the individual interviews, pupils gave positive comments. Some of the comments that the children said: "I like touching the Interactive Whiteboard," "my finger is magic," "I like when the lines get different," "it's a lot more easy using the interactive whiteboard, but I don't know why," and "the board is magic."
8. I am happy when my classmates see my answers on interactive whiteboard.	This question also deals with children's feelings and attitude towards the use of interactive whiteboard in classrooms. It is	Although the researcher has come across studies that indicate children's joy of joining others in reading or answering on the

	essential for teachers and educators to know what the child feels when the answers are displayed in front of the class. If the child does not approve it may lead to the child's withdrawal from participation because of the fear of having classmates scrutinize the answers.	interactive whiteboard, a study that indicates or suggests this question was not found. Thus, the researcher found it essential to ask the children this question to be able to know their feelings towards this point.
9. Using interactive whiteboard is easy for me.	It is essential to ask children to do things that they are capable of and within their abilities. This is because if children are asked to do tasks beyond their abilities, it will have negative effects on them and would discourage them to participate in a task fearing of failure.	1. Solvie (2001) study showed that children found that using interactive whiteboard was easy and one child even commented that it was a lot easier for him to use the interactive whiteboard although he did not know why.

Table 3.1: Questionnaire questions and the rationale for asking them

Different images were used in the questionnaire to express different responses and attitudes. This was done because "for children under 11, visual stimuli can be especially useful in the questioning process, because pictures make the issue far more concrete than verbal representation alone" (Scott, 1999, p. 102). The pupils were asked to tick the option which they felt represented their opinion or attitude. The responses

given to the children were restricted to three; agree, disagree and don't know. This was done because it is difficult for children to differentiate between "strongly agree" "strongly disagree" or "agree" "disagree". Borgers et al. (2000) argued that "more response options can place a burden on children because of the cognitive demands" (p. 17). However, in the questionnaire given to the pupils the option of 'don't know' which researchers such as Bell (2007) suggested to avoid using but as she said "there may be both advantages and disadvantages" (p. 466) in offering as an option. She argued that this causes a dilemma for researchers because on one hand they wish to allow respondents to give this response if it is valid to them "but on the other recalling that respondents are cognitive misers" (ibid) as researchers do not want to discourage the children from voicing their opinion if they have one by offering "an easy way out" (ibid). The researcher chose to give this option to pupils in this study because although Group BG and Group CB did not have IWB in their classroom in Year 5, they had it in previous years. As a result, it was felt that having this option will be easier for these pupils to choose when they faced a question that asked them certain information that they are unable to remember or give an opinion about.

The questionnaire was written in Arabic to avoid any misunderstanding and to make it easier for the pupils. It was divided into two sections; the questions in the first section addressed the effects IWB use on the pupils' learning process and in the second section the questions addressed the pupils' general attitudes towards IWB. These questions were designed to tackle the pupils own experiences and attitudes with and towards IWB because studies have shown that children are able to provide more reliable information about themselves with respect to a range of issues than adults who

know them well (Tizard, 1986). It is good “to try and collect information directly from children on topics for which they are the best informant, such as their feelings, and other subjective phenomena. Children are also the best respondents on factual or general questions that are outside the scope of parents’ or guardians’ knowledge” (De leeuw, 2011, p. 6) this in a way gives the study more reliability.

3.5.3. Observation

Observation was chosen as an instrument in the study because it would play a huge role to help the researcher assess the pupils’ motivation and enthusiasm as these aspects are best measured by observing the pupils’ dynamic and interaction with each other, with their teacher and with the IWB. It would also allow the researcher to observe the pupils’ gestures and reactions when using the IWB; gestures such as facial expressions and actions that are interpreted through body language which would help to deepen the researcher’s understanding of the pupils’ responses to the questionnaire’s questions .

Observation also offers researcher the opportunity to gather information from natural occurring social situations. Robson (2002) argued that what people do may differ from what they claim to do thus observation provides a reality check. It also enables a researcher to look afresh at daily behaviour that otherwise may be taken for granted or goes unnoticed (Cooper et al, 2001).

In this study naturalistic or unstructured observation was used because it enables a researcher to observe the participants in their natural habitat without any manipulation or interference from the researcher. This allows the participants under study to act and

behave naturally therefore achieving more credibility. It provides as Cohen says “a rich description of a situation which, in turn, can lead to the subsequent generation of hypotheses” (Cohen et al., 2007, p. 398) and gives the researcher the opportunity to have a slight different understanding of the context being observed which can only come through personal experience. It may also provide answers or explanations to some of the assumptions and inquiries the researcher might have regarding the pupils’ test results.

For this study, four teachers from different schools accepted to participate in the study and agreed that I observe their classes. Before attending the classes of these teachers, I sat down with them to explain and discuss the study and its aims. I also introduced myself to the pupils and explained to them the reasons for my visits, to overcome any awkwardness during observation. I chose to go four days a week and sometimes double period to familiarise them with my presence as it also helped to build a rapport and act in a more natural way thereby increasing credibility. During observation I was seated at the back of the classrooms where I was capable to observe the whole classroom.

For the observation, I had an observation sheet (appendix 4) in which I noted the name of the teacher, the school, and the date. It also included a section in which I ticked the time the teacher used IWB and the kind of resources she used. Following the principle of unstructured observation, I had no checklist or categories to tick or to look for as I interpreted and noted what was happening in each class to later clarify any inquiries regarding the test results and the pupils’ questionnaire.

3.6. Participants of the study

3.6.1. Teachers:

Four primary English language teachers from four government schools were asked to participate in this study. All teachers are female and in their twenties with similar working experience, as they all had been working for more than three years and graduated from the same program at Bahrain Teachers College. Although all four teachers were in schools within King's Hamad Schools of the Future' Project, two of these classrooms had not been equipped with IWB. This resulted in these two teachers using other teaching aids such as overhead projector and other software programmes like Microsoft Word, Power Point etc. The rationale behind including these teachers in the study was to assess the dynamic in the classrooms with the pupils and teachers who used IWB in comparison to those without IWB. It also helped to examine the influence IWB had on pupils' attainments by comparing the test results of pupils with two different teaching methods.

All teachers agreed to participate in the study due to their personal interest and enthusiasm for IWB use. They were all Bahraini but with different working experience which may have influenced their methods, style and approach to teaching with various teaching aids including IWB. Each teacher chose one of her Year 5 classrooms to participate in the study. Because government schools in Bahrain are single sex schools, each classroom consisted of either male or female pupils. However, due to shortage of male teachers, some primary boys' schools are run by female administration and

teaching staff. Two of the participating teachers taught in primary boys' schools, while the other two were teaching in primary girls' schools.

3.6.2. Pupils:

All 104 boys and girls participating in the study were aged between 8 and 10 years and hailed only from two areas in Bahrain. This was orchestrated by the researcher to ensure that all the pupils were from similar social and economic backgrounds. Each group also had exactly 26 pupils as these classes were chosen specifically to get an equal number of pupils in all groups. In addition, all four groups were taught with IWB from their Year 1. However this changed for two groups in Year 5 as their classrooms were not equipped with IWB; the reason being installations of IWB in government schools is run according to a plan set by the Ministry of Education when it started the 'King Hamad Schools of the Future' project in 2004.

The following table describes the group type, school area, classroom size, and the textbook used:

Group type	**School Area**	**Year 5 Classroom size**	**Textbook used**
A Boys with IWB (ABIWB)	West Riffa	26	*Back Pack 4 student book and work book* Authors: Mario Herrera and Diane Pinkley. Publishers: Pearson Longman (Bahrain edition)
B Girls (BG)	West Riffa	26	
C Boys (CB)	Muharraq	26	
D Girls with IWB (DGIWB)	Muharraq	26	

Table 3.2: illustrates the group type, school area, classroom size, and the textbook used

3.7. Setting and sample

As mentioned earlier, the study was conducted at four government primary schools located in Muharraq and West Riffa in Bahrain. From each area one girls' and one boys' school was chosen. The schools are within King's Hamad Schools of the Future Project; however, in Muharraq, only the girls' school had its Year 5 classrooms installed with IWB. The boys' school which is in the same neighbourhood still had no IWB installed in its Year 5 classrooms. In West Riffa the situation was reversed; the boys' school had IWB installed in all its classrooms including Year 5 and the girls' school which is nearby had IWB installed in almost all its classrooms except Year 5 (see table 1, student's section).

The purpose and the instruments of the study were also discussed with the schools' Principal. A schedule of observation was agreed upon with the respective teachers and Principal. All Principals were supportive of the study and welcomed the opportunity for their schools to participate in such a study.

3.8. Ethical considerations and gaining access

In order to get access to the schools, the teachers and the pupils, the Ministry of Education was approached and a form was completed in which I explained the purpose of the study, submitted copies of the study's instruments plus a letter from the University of Exeter confirming the researcher's status. After granting the approval from the official from the ministry of education (Appendix 5) and thereafter the approval from University of Exeter to commence the research at schools (Appendix 6), I presented to the respective school Principals the approval from the Ministry of Education which granted

me access to the schools of my choice to conduct the study. The selected teachers were asked for approval personally. However, the parents of the pupils were sent letters (Appendix 7) to ask for approval for the child's participation in the study. After receiving the consent from all parties, I started the study by piloting the questionnaire in one of the selected school.

It is also important to indicate that when I visited the schools of group B (girls) and group C (boys), I discovered that they did not have IWB in their classrooms and they were not taught by the technology. Because of this, they were chosen for this study. No school or teachers were asked to deprive the children from the use of IWB.

3.9. Pilot Study

Pilot studies can be based on qualitative and quantitative methods and are conducted to avoid any anticipated problems that might occur while conducting the actual study. Although conducting pilot study may be time consuming, frustrating and filled with unexpected problems, it provides researchers with the opportunity to deal with any unanticipated problems before embarking with the study on a larger scale, and wasting time and money (Mason et al., 1995).

The pilot study was conducted to check that the content, design, and vocabulary of the ability test were clear and familiar to the pupils. The questionnaire was also tested in terms of its clarity and simplicity to complete. A group of 20 pupils who were at the same age and same academic level as the target population were asked to take the test and answer the questionnaire (the Arabic version). 10 of these pupils were taught with IWB and the other 10 were not. All the pupils took the test and answered the

questionnaire without any difficulties and all assured the researcher on the clarity of the questions.

3.10. Data collection

The investigation of the study required the use of three research instruments which all needed the cooperation of the participating teachers and Principals. The first instrument that was used was observation. Observation was a fundamental tool to use in the study as it provided me with the most data in understanding the pupils' attitudes and feelings in the classrooms plus, as mentioned earlier; it would help me in recognizing the significance of the pupils' responses in the questionnaire especially that interviewed were impossible to conduct because of time restrain as it would be explained later.

Observation data was collected on a checklist form (Appendix 4). Observations were scheduled with teachers and were decided to be made from 5th – 14th April, 2015, during which the researcher visited each teacher four times. On the 5th of April, 2015 I started my observation with visits to teachers of group ABIWB and BG who were teaching in primary schools in West Riffa. Having the two schools adjoined to each other made it easy for me to transfer from one school to another and reach the classrooms early; this enabled me to attend any periods I wanted. However, the majority of the visits were in the final periods hence the extensive use of activities that were like games in nature. During the visits, I noticed that both teachers were teaching similar units. In all observation I was seated at the back of the classroom and was given the permission to use the observation form.

In the second week of April 2015, as scheduled, I started visiting the teachers of groups CB and DGIWB, who were teaching in primary schools in Muharraq. Both schools were relatively close to each other and needed me ten minutes only to move from one school to the other. The observation for these groups started on the 12th of April.

Similar to the process which was conducted observing groups ABIWB and BG, I was seated at the back of the classroom of groups CB and DGIWB and took notes using the observation form. During the observation, I was lucky to attend double periods which allowed me to see the impact of having long learning sessions (90 min.) with IWB, on the pupils.

Due to the National Exams for all the pupils in the government schools during the 3rd and the 4th week of April, with the approval of the participating teachers, I scheduled to complete the questionnaire with the pupils on 18th and 19th of May, and decided to give the pupils the test on the 27th and 28th May.

On the 18th and 19th of May, 2015 I went to all participating schools and in the presence of the respective teachers, distributed the Arabic version of the questionnaire (Appendix 3) to the pupils. She explained to them what they needed to do and instructed them to ask their teacher or her to explain any ambiguous question. It took the pupils nearly 10 minutes to answer the questions in the questionnaire and all the questions seemed to be clear, as no pupils asked the teachers or the researcher for an explanation. After they answered all the questions, the completed questionnaires were collected and an analysis of the data began using the programme Statistical Package for the Social Science (SPSS).

I returned to the participating schools on the 27th and 28th of the same month to give the pupils the test with the help of their respective teachers. The teachers and I distributed the test papers and allocated 20 minutes for the pupils to finish the test. The duration of the test was recommended by the teachers who indicated that the pupils had been given short tests similar to the study's test and they were able to finish in the suggested time.

As the study's test was designed similar to previous tests that the pupils had, all of them seemed to be satisfied with the test questions and no one asked for an explanation. After they all finished answering the questions, the test papers were collected and I thanked the teachers and the pupils, and assured the teachers that the test results and the questionnaire responses will only be used for the study and no one, except me, will have access to them. After collecting the test, I started marking them and then transferred the data collected from the tests papers to analyse them using the Kruskal-Wallis test.

3.11. Validity and reliability of the study

Choosing to use pragmatic paradigm for the study meant that the researcher was able to use qualitative and quantitative methods of collecting data. This meant the use of different instruments which it was thought would be suitable for collecting the kind of data that was needed. By using different qualitative and quantitative instruments the issue of validity and reliability arises.

According to Patten (2004) and Kumar (2005) an instrument is valid if it measures what the researcher intended it to measure and precisely achieves the

purpose for which it was designed. However, Patten argued that validity is a matter of degree and that any discussion should be concerned and focused with how much a test is valid. Patten stated that no test is valid thus a researcher needs a kind of assurance that the instrument being used in the study will produce accurate conclusions. He also emphasised the appropriateness of the instrument's content and identifies three principles to improve content validity. These are: using of a broad sample of content rather than a narrow one, emphasizing important material, and writing appropriate questions to measure appropriate skill. O'Leary (2004) elaborates on the idea of validity and stated that it premised on the idea or notion that what is being studied can be measured and captured, seeks to validate the truth and accuracy of any findings or conclusions drawn from the data, indicates that the conclusions drawn are trustworthy and shows that the methods warrant the conclusions.

3.11.1. Content validity of the questionnaire

To ensure content validity of this study instruments, I sought the advice of two colleagues at the University of Bahrain who are experts in the field of childhood and child research and requested their feedback on the appropriateness of the language used and the design of the questionnaire. Comments from the two colleagues were taken into consideration and several alterations were made on the questionnaire's language and design.

3.11.2. Content validity of the test

As for the content validity of the test, I sought the help of the participating teachers in giving me some of the tests that they had used with the pupils and the textbooks that the pupils were using in order to accustom myself with the kind of tests the pupils were familiar with. After designing the test, I met with the teachers, showed them the test, and made changes on the test's length and content.

Another measurement I also used to ensure the content validity was a pilot study. The questionnaire and the test were circulated to 20 pupils of the same age group and year of schooling as the study's participants.

3.11.3. Reliability

Patten (2004) asserts that "validity is more important than reliability" (p. 71) however, addressing it in a study is essential. Wallen et al. (2001) argued that reliability deals with the consistency of the data collected. Nunan (1999) however claimed that reliability in quantitative research is different from qualitative research. He explained that gaining reliability in quantitative research is straightforward because the collected data is in numerical form but gaining consistent results in qualitative research is fairly demanding and difficult. This is due to the nature of the data which is in narrative and subjective form. Joppe (2000) defined reliability as the degree to which results are reliable over time and is a correct representation of the total population being researched; also "if the results of a study can be reproduced under a similar methodology, then the research instrument is considered to be reliable" (p.1).

Charles (1995) agreed with the idea of consistency in which the questionnaire's items are answered and the results stay relatively the same when they are retested at two different times. This according to him shows a high degree of stability and thus indicates a high degree of reliability. Joppe (2000) however was sceptical with the test-retest method and argued that this can make the instrument, to a certain degree, unreliable. She stated that this may make the respondent sensitive to the topic and thus influence the given response.

In order to gain reliability in pupils' responses and to provide content reliability of the survey instruments, attention was devoted to the respondent measurable characteristic for instance age and education. There are various studies that support this and emphasise the importance of these characteristics on the reliability of the responses (Alwin et al., 1991, Borgers et al., 2004). Consequently, taking into consideration such different characteristic, only the participants who were all similar in age group and years of education were selected to try to obtain similar cognitive ability. As it was explained earlier, attention was also given to the wording of the questions both in the questionnaire and the test to prevent any ambiguity that may affect the responses because "children differ in their ability to determine the literal meaning of a particular questions due to more or less pronounced recognition vocabulary thus, children whose recognition vocabulary is less advanced will have more problems when decoding a question" (Fuchs, 2009, p. 4). All the questions in the questionnaire were also constructed in a positive manner and used positive wording. A study has shown that although negatively formulated questions have shown no effect on the reliability measures, "children respond consistently differently on negatively formulated questions

than on positively formulated questions" (Borgers et al., 2004 p. 17). Thus, it was "advisable not to use negatively phrased items" (Borgers et al., 2000, p. 65).

To ensure the reliability of the instruments, a pilot study was conducted with 20 pupils of the same age group and year of schooling. The pilot study responses showed consistency in responses which indicated the reliability of the study's instruments.

Cronbach's alpha using SPSS was employed to assess the reliability of the 10 test items in both the pilot run and the actual study. Item, and Scale options were selected for suggestions of deleting items to improve reliability but no suggestions were given. Cronbach's alpha was .572 in the pilot run and .462 in the actual study giving an indication of a reasonable reliability of the test items.

Case Processing Summary of the pilot run

		N	%
Cases	Valid	8	40.0
	Excluded[a]	12	60.0
	Total	20	100.0

Table 3.3: a. Listwise deletion based on all variables in the procedure.

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.572	.602	2

Table 3.4 Reliability Statistics of the pilot run

Case Processing Summary of the study run of the test

		N	%
Cases	Valid	52	100.0
	Excluded[a]	0	.0
	Total	52	100.0

Table 3.5. a. Listwise deletion based on all variables in the procedure.

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.462	.462	2

Table 3.6 Reliability Statistics of the study run of the test

The same measure was used for the 9 items of the questionnaire items; Cronbach's alpha is .812 indicating a high reliability.

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.812	.811	9

Table 3.7 Reliability Statistics of the questionnaire items

3.12. Summary

This chapter presented a description of the study's aims and questions. It also clarified the rational for using pragmatic paradigm and the different instruments that were used to collect data. Great length of the chapter was dedicated to illustrate the designing of Year 5 test and the questionnaire questions. The chapter also explained the issues of validity and reliability, their significance, and how to achieve them in a study. A total description of the data's collection and analysis were also given plus a description of the study's participants, schools, and textbooks. The final section of the chapter explained how the reliability and validity of the questionnaire and the test were ensured in this study.

The following chapter will display the findings that I managed to obtain by using the questionnaire and the observation which will present a clear picture of the young learners' use of IWB. It will also illustrate the results of Kruskal-Wallis test that was used to analyse and present comparison of Year 5 and Year 4 vocabulary tests.

CHAPTER IV

DATA ANALYSIS AND INTERPRETATION

4.1 Introduction

The methodology described in the previous chapter provided the basis for data gathering. This chapter gives an extensive analysis of the data that was collected and examines the significance of the findings. It is divided into three sections; the first part of the chapter shows the analysis of the pupils' responses to the questionnaire which answers the study's first question; the second part deals with the analysis of the observation which answers to study's second question; the third and the final part of the chapter presents an analysis of the two vocabulary tests which answer the study's third question.

4.2 Study Findings

4.2.1 The study's First question

- *What attitude and perception do the pupils hold towards the use of IWB in their learning?*

When analyzing the participants' responses to all the questions, there were slight differences between the responses of each question as the following table shows:

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
q1	104	1.00	3.00	2.8365	.54167
q2	104	1.00	3.00	2.6827	.67211
q3	104	1.00	3.00	2.7596	.56595
q4	104	1.00	3.00	2.7596	.63084
q5	104	1.00	3.00	2.7788	.59049
q6	104	1.00	3.00	2.7019	.69506
q7	104	1.00	3.00	2.7885	.61806
q8	104	1.00	3.00	2.6442	.73628
q9	104	1.00	3.00	2.7404	.59112
Valid N (listwise)	104				

Table 4.1: Pupils' responses to all the questionnaire questions

If we look at the above table we can see that the highest mean is for question one (*I learn more when my teacher use the Interactive whiteboard*) and the second highest mean is question 5 (*I enjoy learning when Interactive whiteboard is used*) in which most of the young learners chose 'I agree' value 3 as response to this question. These positive responses parallel the findings of most studies that have been covered in literature review which have shown significant improvement in the pupils' participation, perception and concentration when IWB was used.

However, to have a fuller understanding of the participants' responses and their significance, an analysis of each question was carried out as the following sections show. The following table shows the four groups and their abbreviation as used in the questionnaire responses:

Group	Abbreviation
Boys with IWB	(ABIWB)
Girls	(BG)
Boys	(CB)
Girls with IWB	(DGIWB)

Table 4.2: The study's four groups with their abbreviation

4.2.1. A. **Question 1: I learn more when my teacher uses the Interactive whiteboard**

Group	I agree	I don't agree	I don't know
ABIWB	26	-	-
BG	23	-	3
CB	20	1	5
DGIWB	26	-	-
Total	**95**	**1**	**8**
Percentage	**91.3 %**	**1.0 %**	**7.7%**

Table 4.3: Pupils' *perception about learning more when the teacher uses the IWB*

Among all the questions, the first question has the highest percentage of pupils agreeing (91.3 %) which underlines and confirms the pupils' perception that IWB has positive impact on their learning. Only 1 student from group CB thought that IWB has no impact on his learning while 8 pupils from both groups BG and CB expressed their uncertainty. The fact that all these 9 pupils are from the groups that did not have IWB in their classrooms may support the claim that IWB plays a role in enhancing the learning process of the pupils. This could be due to IWB quality of providing the children with different learning styles as some studies have illustrated (Glover et al., 2005; Slay et al., 2008; Thompson et al., 2003; Higgins et al., 2005; Weimer, 2001). Teaching young

learners is different from teaching teens or adult as they enjoy learning through the use of unconventional teaching methods. This is because they learn best through seeing, hearing and touching (Walker et al. 2004) thus using IWB features seems to provide teachers with the tools that excite the young learners and makes learning an enjoyable experience. However, teachers without IWB can also establish such this as it is always good idea to bring real items if the vocabulary something that is available to the teachers such as jewellery, postcard and other things that are easy to obtain. However, the different features of IWBs such as moving or dragging a word can simplified the young learners' understanding of new words and enabled them to use them in a new context as it will be illustrated later in the observation section.

4.2.1. B. *Question 2:* I understand the lesson when my teacher uses pictures, videos and sounds on IWB.

As the following table shows, the pupils' responses to the second question asserts Walker et al. (2004) statement as (83, 79.8%) of the participating children agreed that the use of pictures, video and sounds enhance their understanding. This is because when teachers employ various types of activities and teaching methods the "students will be more likely to stay focused on the lesson, thereby increasing the amount of language learning in class" (Kang Shin, 2006, p.4).

Group	I agree	I don't agree	I don't know
ABIWB	24	-	2
BG	17	3	6
CB	16	6	4
DGIWB	26	-	-
Total	**83**	**9**	**12**
Percentage	**79.8 %**	**8.7 %**	**11.5 %**

Table 4.4: Pupils' *perception on their understanding of the lesson when the teacher uses IWB tools, pictures, videos and sounds*

A small percentage (8.7%) of the pupils stated that they do not agree that using videos and sounds would enhance their understanding and all these responses as Table 4.3 shows came from groups BG and CB. 12 pupils (11.5%) indicated their uncertainty; 2 of these came from group ABIWB which is surprising because during the video and audio activities that I observed all the pupils seemed to engage in the activities and were excited with their teacher's utilization of the IWB features. Although IWB may excel in this category but teacher with no IWB can always use CD player and present the children with sound and picture, but this may have some risks as we will see in the observation section (Extract 13).

The positive attitude of 83 of the pupils (79.8 %) is echoed in other studies. Becat's report (2007) on the expansion of IWB in primary schools found that "the interactive whiteboard acts as a multi-modal portal, giving teachers the potential to use still images, moving images and sound, and when used in this way, it can address the needs of learners who find text difficult as the only mode of communication" (p. 5).

4.2.1. C. Question 3: I concentrate more on the board when my teacher uses IWB.

The participants' responses in the following table seem to agree with the idea that IWBs increase learners' concentration.

Group	I agree	I don't agree	I don't know
ABIWB	26	-	-
BG	17	5	4
CB	17	6	3
DGIWB	26	-	-
Total	**86**	**11**	**7**
Percentage	***82.7 %***	***10.6 %***	***6.7 %***

Table 4.5: Pupils *perception on concentration on the board when the teacher uses IWB*

The majority of the pupils 86 (82.7%) agreed and confirmed the positive effects of IWB on their concentration during the lessons. On the other hand only 11 (10.6 %) of the pupils stated their disagreement with this statement. 6 of these pupils came from group CB. Their disagreement could be due to their discontent with the PowerPoint presentation that their teacher used in the funnel task as it will be illustrated in the next section of this chapter (extract 10).

However, as the above table shows 3 of the pupils from group CB chose 'I don't know' as response. These 3 could be among the pupils who while handing in the questionnaire to their teacher were heard saying "معلمه حلو انشوف الدرس مع السبوره الذكيه فنركز (Translated: teacher it is nice to see the lesson with smart board so we concentrate). 4 of the pupils (6.7%) in the second group BG seem to have similar attitude and decided to choose 'I don't know' as a response to this question.

Despite the 7 'I don't know ' responses and the 11 'I don't agree' responses, there are various studies that confirm the findings of this study and highlight the impact of the

video feature of IWB on learners; for example, Manny-Ikan et.al. (2011) study has shown that pupils are more focused when their teacher uses IWB. Hall et al. (2005) had reached similar conclusions in their study and indicated that pupils are more attentive and more motivated when IWB is used.

4.2.1. D. Question 4: I participate more when my teacher uses IWB.

The pupils' interest in using the IWB and working on more tasks was expressed in their responses to question 4 of the questionnaire.

Group	I agree	I don't agree	I don't know
ABIWB	26	-	-
BG	22	1	3
CB	17	2	7
DGIWB	25	-	1
Total	**90**	**3**	**11**
Percentage	***86.5%***	***2.9%***	***10.6%***

Table 4.6: Pupils' *perceptions on their participation when the teacher uses the IWB*

Having 90 out of 104 pupils (86.5%) agree that IWB presence makes them want to participate more confirms the positive attitude that was felt when visiting groups ABIWB and DGIWB and corroborates with the observation data. It may also explain why some of the pupils in group CB who did not have IWB were eager to express their wish to have the technology in their classroom; one pupil (aged 8) commented " *نبغي سبورة ذكية في صفنا*" (translated: we want Smart Board in our classroom) which made his teacher smile and tell him *"inshallah* (if God permits) *you will have one next year in Year 6.*"

Despite the large number of the pupils who agreed with question 4, 11pupils (10.6%) chose 'I don't know' to express their uncertainty regarding the IWB effects on

their participation while only 3 (2.9%) disagreed. All the pupils who disagreed came from the two groups BG and CB who did not have IWB in their classrooms, thus making their disagreement somewhat understandable. This may also explain why 11 of the pupils who chose 'I don't know' came from the same groups.

Yet, as it is illustrated in table 4.6, a pupil from group DGIWB also indicated her uncertainty which is interesting as this group had IWB; unexpected responses such as this one would have been explained if the researcher had the opportunity to interview the pupils, but as it was explained in Chapter 3 – Research Design and Methodology, this was impossible because of the National Exams which were due to start in the 3rd and the 4th week of April and the final exams at the end of May making it impossible to interview the pupils whose summer break started immediately after their final exams. In addition, the researcher was informed by the schools' administration to make sure to end her visits to the schools before these dates.

4.2.1. E. *Question 5:* I enjoy learning when IWB is used.

In question 5 the majority of pupils (90, 86.5%) affirmed that IWB makes learning enjoyable.

Group	I agree	I don't agree	I don't know
ABIWB	24	-	2
BG	19	-	7
CB	21	5	-
DGIWB	26	-	-
Total	**90**	**5**	**9**
Percentage	**86.5%**	**4.8%**	**8.7%**

Table 4.7: Pupils' *perceptions on whether they enjoy learning when IWB is used*

Besides expressing their feelings and opinions in their responses, the pupils in groups ABIWB and DGIWB feeling was translated on their faces and in their reactions; for instance, their feelings and comments that were reported in the section related to their interaction with IWB as it will be explained in the observation section.

The element of enjoyment was also confirmed by a student in Amolo et al. (2007) study who said that having lessons with the technology were “so much fun” and “were so cool it didn’t even feel like learning” (p.4).

Only 5 pupils (5, 4.8%) from group CB did not agree with the enjoyment factor that the majority of the pupils said they get when using IWBs and a small number of the pupils (9, 8.7%) said ‘I don’t know’; 7 of these came from group BG and 2 came from group ABIWB. The 2 pupils from group ABIWB who chose this response may have felt that their teacher did not let them use the IWB as much as they would like to do. However, this is only an assumption thus it would have been interesting to interview the children and ask them about such responses, as explained earlier.

4.2.1. F. Question 6: I prefer the lessons that are taught with IWB.

Parallel findings to the previous question are echoed in the pupils’ responses to question 6 as the majority of the pupils (87, 83.7 %) confirmed their preference of lessons that are taught with IWB and only 3 students (2.9 %) disagreed; this low number of disagreements may demonstrate the children’s’ general feelings and attitudes towards learning through technology. This was evident when one of the pupils from group BG asked the researcher to tell the school’s administration to move her class to a classroom with IWB.

Group	I agree	I don't agree	I don't know
ABIWB	26	-	-
BG	19	1	6
CB	16	2	8
DGIWB	26	-	-
Total	**87**	**3**	**14**
Percentage	**83.7 %**	**2.9 %**	**13.5 %**

Table 4.8: Pupils' *perceptions on their preference for lessons to be taught with IWB*

Nevertheless, the number of pupils who stated their uncertainty to this question is larger than the previous question. 14 pupils (13.5%) said they were uncertain if they prefer lessons with IWB, but as Table 4.8 shows, all these pupils are from group BG and BC which may explain their responses.

Despite this, various studies such as Miller et al. (2004 & 2010) and Biro's (2011) revealed similar findings to this study and suggested that there is some kind of agreement that pupils have positive perception of IWBs thus preferring lessons with the technology.

4.2.1. G. Question 7: I am happy when I use IWB.

The response to this question highlight the children attitude in previous questions as the majority of the pupils (93, 89.4%) expressed their happiness when using the IWB.

Group	I agree	I don't agree	I don't know
ABIWB	26	-	-
BG	22	-	4
CB	19	-	7
DGIWB	26	-	-
Total	**93**	**-**	**11**
Percentage	**89.4 %**	**-**	**10.6%**

Table 4.9: Pupils *perceptions on whether they are happy when they use IWB*

The fact that no one disagreed with the statement of this question indicates that almost all the pupils in all four groups are happy when using IWB. Although there were few pupils (11, 10.6%) indicated their uncertainty, these were from the two groups that did not have IWB in their classroom, so their response could be understandable. Despite these 11 pupils response, their classmates expressed different attitude and agreed with the other two groups. This conflicting attitude could be related to the fact that in previous grades groups were taught by IWBs and experienced using them in their lessons.

4.2.1. H. Question 8: I am happy when my classmates see my answers on IWB.

The pupils' expressed the same positive attitude towards having their peers see their answers on the IWB.

Group	I agree	I don't agree	I don't know
ABIWB	25	-	1
BG	18	3	5
CB	16	2	8
DGIWB	24	-	2
Total	**83**	**5**	**16**
Percentage	***79.8 %***	***4.8 %***	***15.4 %***

Table 4.10: Pupils *perceptions on their happiness when classmates see their answers on the IWB*

As the above Table shows, a small number of the pupils (16,15.4%) chose 'I don't know'; 3 of these came from groups ABIWB and DGIWB which is surprising because during my visits only few pupils in these groups seemed reluctant to use IWB. This may be due to their young age or my presence.

The encouragement by the teachers which was observed may have been the reason why (83, 79.8%) of the pupils agreed with the statement and thought that sharing their answers on the IWB brought joy to them. Some studies that investigated the IWBs' use with young learners reached similar findings. A participating teacher in Duran et al. (2011) study pointed out "children participate more and they do not feel so embarrassed when they are doing an activity on the Smart Board. In that way, I think it is a powerful tool" (Teacher 2, p. 227). In addition, Solvie (2004) indicated that "when students themselves manipulated text on the board, their enthusiasm increased, and they were immediately engaged in the lesson" (p. 486).

The pupils' agreement on this statement was also reflected in the physical gestures that some pupils use to encourage their peers; for example, the thumbs up gesture which some pupils gave to their group members when they got back to their seats and reflected also in the encouraging comments that they gave each other after performing a task on the board; such as "*اللون الي اخترتيه للكتابه حلو*" (translated: the color you chose to write with is nice) and *"عجيب"* (translated: awesome).

Higgins et al. (2005) revealed similar findings in their study as one of their pupils commented, "*I would feel happy having my work shown on the interactive whiteboard because people can give you some good views on your story*" (p. 859).

Although the majority of the pupils were happy to go to the IWB and show confidence when writing and performing tasks in front of their peers, some were reluctant to do so due to their limited technical skills.

This technical limitation that few of the pupils illustrated in the classrooms were recorded in some observation extracts as it will be illustrated in the next section. These pupils who showed these limitations could be among the 19 pupils who expressed uncertainty and disagreement to question 9.

4.2.1. I. Question 9: Using IWB is easy for me.

Group	I agree	I don't agree	I don't know
ABIWB	22	4	-
BG	20	3	3
CB	20	1	5
DGIWB	23	3	-
Total	**85**	**11**	**8**
Percentage	**81.7%**	**10.6%**	**7.7 %**

Table 4.11: Pupils' *perception on the ease of using IWB*

As the table shows, a total of (11, 10.6 %) the Pupils have indicated that using the interactive board was not easy for them; 7 of these came from groups ABIWB and DGIWB and the rest came from the other two groups. Few Pupils (8, 7.7 %) chose to say 'I don't know'. All these pupils came from groups BG and CB which makes their response understandable. The difficulties that the pupils had and were recorded in the different extracts such as Extract 1 and Extract 19 are echoed in the study of Al-Faki et al. (2014) in which they pointed out "pupils found it [IWB] too difficult to write on, manipulate, drag…etc.; even teachers might have some difficulties" (p. 140).

Another problem which was reported in other studies but was not observed in this study is the problem associated with IWBs' height. This issue was mentioned by Gage (2004) who explained that in primary schools "the height of the board is also an important consideration: the height that is comfortable for the teacher is probably too high for the children, and vice versa" (p.6); this problem she says can be solved by providing a step stool to stand on for children who find it difficult to reach a task on the board. While visiting the groups, it was noticed that very few of the Pupils were shorter than their peers, but the teachers of these groups seem to be aware of this issue and so step stools were available in all the classrooms; for example, when Yousif was selected to perform a task, he took the step stool that was available next to the IWB and stood on it (Extract 7). Seeing Yousif spontaneously picking up the step stool and using it reflects his ease in going to the board and doing the task.

Despite these reported difficulties, the majority of the pupils (85, 81.7%) agreed that using IWB was easy for them. This kind of attitude was noted in other studies such as Wood's (2001) study in which findings suggested that pupils, who normally would not choose to work on computer, were actually choosing to work on IWB which enables them perform activities without requiring the fine-motor skills required in operating a mouse. Goodison (2002) like Wood reported how primary young pupils preferred using IWB as opposed to a computer due to the difficulty they find in using the keyboard and manipulating the mouse.

Bell (2002) argued that learners with limited skills can enjoy using IWBs more than computers; because unlike computers, programs on IWB can be operated by

tapping the board and not by clicking the mouse. In addition, teachers with young learners have reported success by having the young learners write on the board with their fingers rather than the pen which comes with the IWB.

Although the questionnaire's questions were in favour of IWB, it is essential to remember that these findings are limited to the participants of the study thus cannot be generalised.

4.2.2. The study's second question

The data findings and analysis of this section deals with the following question

- *What effects does the use of IWBs have on pupils' participation and interaction when learning new vocabulary?*

During the observation of the four groups to investigate the effects of IWB on young learners, three themes emerged: IWB impact on children as learners, IWB impact on pedagogy, and IWB interactional affordances. These themes will be explained in detail in the following sections. *It is important to note that all the interaction between the teachers and the pupils or between the pupils themselves in the observation extracts were in English except those which are written in Arabic and translated to English.*

4.2.2.1. IWB impact on children as learners

This theme relates to these three subthemes: pupils' interaction, students' learning, and pupils' behavior.

4.2.2.1.1. Pupils' interaction

One thing that child psychologist agree on is that young learners are sociable and like to interact with each other and other people hence, interacting with other young learners and with teachers is something many young learners value and enjoy. Furthermore, some scholars of children psychology emphasized the importance of young learners' interaction with their peers and teachers as a major factor in developing and producing pupils who will be successful academically and socially in their future (Booren et al., 2012). This made several teachers and educators consider IWB as a major or important element in teaching young learners. This view was highlighted by scholars such as Higgins et al. (2005), Yáñez et al. (2010), and Aytaç (2013) whose studies identified one IWB aspect of encouraging pupils' interaction. In this study two aspects of interaction have been identified; the first aspect is the young learners' interaction with each other and with their teacher, and the second one is the young learners' interaction with IWB itself.

4.2.2.1.1. A. Pupils' interaction with each other and with their teacher

Although all classrooms were designed to put the pupils in teams of four, five, or six to encourage interaction, the interaction in groups ABIWB (boys taught with interactive whiteboard) and DGIWB (girls taught with interactive whiteboard) was different from the interaction in the other two groups, BG (girls) and CB (boys) which had conventional blackboard in their classrooms. It was obvious that the presence of IWB had prompted the pupils' interaction from the minute the teachers entered the classroom and asked their pupils to volunteer to write the date on the IWB. Such

requests played a role in awakening the pupils' interest and creating energy and a buzz in the classroom. It also made the pupils eager to be selected by their teacher and to start the lesson. Such enthusiasm was noted in Extract 1 of my first visit to group ABIWB.

The teacher begins the lesson by inviting volunteers to write today's date on the IWB, to which all children shout *"Me, Teacher, ME!"* The teacher selects Ali who looks at his peers and asks them "*what colour shall I choose?"* As the children shout suggestions, the teacher instructs them to decide on a colour in teams. While sitting at the back of the class, I could hear one team discussing

the choice of the colour red in Arabic: "*خلونا نختار الاحمر لانه حلو*" (translated: let us choose the red because it is nice). Another team discussed in L1 choosing the colour green. The rest of the teams however used English in their discussion.

After a few minutes, Ali takes suggestions from his classmates and decides on the colour green because three teams chose it.

Using his finger, Ali clicked on the pen icon on the toolbar and chose the colour green, and then he wrote the date. His writing seemed too big so the teacher asks him: "*Ali, can you make your writing smaller*?" Ali smiles and says "*Yes."*

Ali puts his finger on the white space (not on the writing) thus nothing happened. He looks at his teacher and asks for his teacher's help. The teacher stands next to him and shows him how to resize his writing. Once Ali realizes how to do it, he anxiously takes control of the board and puts his finger on the writing and once he does that, a border appears around the date making it like a picture object on the board. The teacher encourages him and instructs him further. Ali presses and holds the grey dot on the right hand corner of the border, presses it and drags it inward to resize the text. The teacher praises him and seems very proud of him.

(Extract 1)

Ali's interaction with IWB was significant as it showed his enthusiasm to use the IWB's tools despite his limitation in some technical issues. However, this limitation did not affect him as the way he knew how to operate the board, how to choose the colour, and how to write reflected considerable confidence on his part. It was also noted that

the teacher guided Ali when he needed assistance and stepped back when he asked her to do so. This revealed the importance of an amiable environment for children to learn.

Similar interaction and enthusiasm was observed in group DGIWB but in this group the teacher and the class had a system in which they had a class list posted on a notice board and pupils took turns in writing the date on the IWB. On my first visit to this group, the teacher gave the student in-charge on that day the choice to either choose the color of the font herself or to ask her peers. The student chose the color blue and did not ask her peers' opinion. This made the interaction between the children themselves and with their teacher less than the interaction that was observed in group ABIWB, but at the end of the lesson the teacher of group DGIWB commented that having a class list would give the pupils a sense of independence in making decisions.

On the next visit to group DGIWB, I noticed that there was a longer interaction between the student in-charge of writing the date and her teacher as Extract 2 illustrates:

Mariam tells her teacher *"Teacher, I wrote April wrong!"* Pointing at the toolbar, the teacher instructs her to use the eraser and to rewrite it. Mariam uses the eraser from the toolbar and erases the text. After erasing the text, she clicks the line style and changes the line thickness of her text. She says to the teacher that she wants to make the text bigger. Two pupils from Mariam's team tell the teacher that they will instruct Mariam what to do; so they start telling her the steps and Mariam manages to resize her text.

(Extract 2)

Through these extracts the pupils' competence in using IWB is lucid, and their utilisation of certain language components such as asking questions and giving instructions seemed to intensify and become smoother than the first visit. This was evident on another visit to group DGIWB, when the pupils themselves instructed their classmate on how to change the color of the font when she forgot how to do so. In addition, teacher- pupils and pupils—pupils' interaction was not only noted in this occasion but throughout the lessons as the following extract reveals:

On another visit to DGIWB the teacher showed the pupils on the IWB a reading passage called 'Way Back Then' which pupils had in their textbooks. The teacher asked the pupils to look at the reading and identify the rhyming words.

After working on the task in groups, the pupils raise their hands. The teacher asks Huda to come and do the first word. Huda goes and points to the word ago in the first line and the word slow in the second line. The teacher asks her to read the two lines which she does. Then the teacher asks her whether she wants to circle or highlight the two words. Huda highlights the two words with yellow which all her peers seemed to like. The teacher commends her for her answers and she goes back. Next, the teacher chooses Moza who goes running to the board and says "كلمه سهله" (translated: easy word) She then points the word talk and the word walk and as Huda she reads the two lines. Moza asks her teacher if she can circle the words. The teacher agrees and Moza slowly manages to circle the words. 3 more pupils go to the board and pick the rhyming words. All told their teachers that they want to highlight the words. **(Extract 3)**

The impact of the IWB on teacher—pupils interaction and pupils— pupils interaction is evident in the different observation extracts where the interaction between

all is lively and very dynamic. This is kind of interaction unfortunately was less obvious when visiting the two other groups BG and CB.

The kind of interaction that was observed in the previous extracts was slightly missing in groups BG and CB as there was very little interaction between the pupils and their teacher as the following extract from my visit to group BG shows:

> After entering the classroom, the teacher greets the children and then asks for volunteers to write the date of the day. Few girls raise their hands, and the teacher chooses Mona for the task. Mona looks around and sees three markers with three different colors but she decides to ask her peers to choose either the red or the blue; "what color shall I choose?" she says. Majority of the girls say "blue" and few say "red". Mona goes with the majority and uses the color blue to write the date on the blackboard. The teacher praises her and she goes back to her seat.
>
> **(Extract 4)**

Despite the teacher's obvious effort to encourage the pupils to interact more with their peers, only a few pupils made comments to Mona thus limiting the language used during the activity. This may be due to the absence of IWB in group BG whereas the presence of IWB in groups ABIWB and DGIWB had clearly created situations that paved the way for student-teacher interaction and student-student interaction. These interactions were also facilitated by the technical difficulties that some of the pupils had when using the IWB. This raises a question as to what it will be like in the future when the pupils become more IWB literate. Will the interaction between the pupils and their teachers be less or will it continue to be the same? A further study researching these pupils in higher grades would be interesting to conduct. It is beyond the scope of this study to determine if these skills are life-long or limited to the specific situations in which they had been observed.

The daily scenario that was observed in the above three groups was missing in group CB because the head teacher of the classroom had instructed the pupils of this group to write daily the date in Arabic and English in the first period. Therefore, this may have deprived the English language teacher of an opportunity to seize the situation to develop and expand the pupils' speaking skill. Cameron (2001) explained that there are situations in the classroom that enable a foreign language teacher to interact with young learners and to enhance their language development; as situations become more familiar, the pupils are given an opportunity to predict the meaning of the situation and the words used. This also, as Cameron pointed out, provides an opportunity for teachers to add variations and new vocabulary that would help the pupils in producing a more complex language and eventually enrich their language learning (pp 10&11).

4.2.2.1.1. B. Pupils' interaction with IWB

Recognising groups ABIWB and DGIWB's interest and passion for IWB was easy as the pupils' feelings were translated through their reactions whenever the teacher asked for volunteers to do a task on IWB. The classrooms of these two groups were always characterised by pupils eager to engage in all kinds of language tasks such as the following example in which group DGIWB's teacher used the IWB to emphasize the use of the new vocabulary that the pupils had just come across in their reading on the different birthday rituals in some countries.

Using the pen on IWB, the teacher clicked on 'Insert' and imported pictures representing the different birthday rituals in some countries. Next, she dragged these and dropped them at the top of the IWB, and at the bottom of the board she placed the

names of the countries which these rituals came from. In teams, the pupils were instructed to match each ritual with the correct country and were given five minutes to discuss the task and work out the answers. When the time for the task was up, the teacher asked for volunteers to go to the IWB and drag the name of each country and drop it under the matching picture showing the correct celebration. All the pupils had no difficulty in dragging and dropping the pictures under the correct countries except 2 pupils as Extract 5 demonstrates:

> The teacher asks Nora to come and match the next picture. Nora goes to the IWB but instead of dragging a picture she seems uncertain of her answer, so she asks her peers. Her peers instruct her to drag the last picture (a picture of a girl blowing out candles) Nora puts her hands on the picture and again asks her peers who confirm her choice. She drags it but then loses her control of the picture which makes the teacher step in to help her till Nora manages to control it and drops it under Canada.
>
> The teacher praises her and then asks Lulwa to go to the IWB and choose another picture. Lulwa states that she wants to drag the picture representing a birthday celebration in India. However, she struggles dragging the picture of a boy giving candy to children in the classroom, so the teacher steps in and helps her. Once, she got hold of it, Lulwa tells her teacher to let her do it by herself. The teacher steps back and observes the student dragging the picture and then dropping it under India.
>
> **(Extract 5)**

Although the task demanded the skill of dragging and dropping a picture across the IWB, all pupils wanted to have a go on the IWB despite some of them having difficulties in controlling the pictures and dragging them across the board. This positive feeling was also reflected in their interaction and in their body language for as soon as

they sat on their seats, they started talking to their friends describing their experience with the IWB. One pupil was heard saying "سحب الصوره كان عجيب" (translated: it was awesome dragging the picture).Some other pupils asked their teacher to give them a second task to do "معلمه عطينا تمرين ثاني" (translated: Teacher, give us another task). It was encouraging to see the 2 children described above (extract 5) happy to participate and that their limited skill did not deter them from raising their hands, going to the board, and performing the task. The teacher's attitude was also positive as she was willing to gladly let one of them continue dragging the picture without her help.

The enjoyment that these pupils found in using their fingers or hands to write on the board was recorded by Solvie (2004) who reported how her first grade children loved writing using both their fingers and the markers. She argued that writing the letters with their fingers allowed them to feel the shape of the letter they were writing, and to see letter components that made sounds they uttered and experience a true "hands on" approach of making and erasing text (p. 485).

The students' eagerness to go to the IWB and to share their answers and experience with their peers was reflected in their response to question 8 of the questionnaire as it was illustrated in the first section of this chapter. The pupils also expressed their interests in using IWB as 90 out of 104 pupils (86.5%) stated that when the teacher uses IWB, they work and participate more.

Nevertheless, it is important to mention that although young learners' interaction may have been influenced by the use of IWB, teachers do not always need to have the IWB in their classrooms to succeed in making the pupils interact; as it will be illustrated in extract 11.

4.2.2.1.2. Pupils' Learning

Besides having an impact on pupils' interaction, according to some studies IWB also plays a role on improving the pupils' learning. This was realized in this study by watching how the different features of IWB assisted and accelerated the pupils' comprehension of vocabulary and syntax. During my second visit to both DGIWB and ABIWB groups, both teachers used IWB tools to simplify the learning and the recollection of new vocabulary. This is important because pupils in each academic year are expected to know the spelling of a number of words. Therefore, to establish this curriculum goal, teachers are required to present pupils with various tasks that would enhance their recollection and enables them to provide correct spelling of the vocabulary.

In a visit to group DGIWB, the teacher gave the pupils a reading text entitled *Changes Over Time* from their textbook. After reading the text with the pupils, the teacher used the IWB to reinforce the pupils' knowledge and recognition of the new collocation words that were encountered in the reading text.

> The teacher clicks on a file on IWB and uploads a task with two sets of words. The first set: electric, paper, iron, plastic, rainy, spider, and band; the second set: records, days, aid, web, pots, lights, and money. The teacher asks the pupils to match a word from the first set with another word from the second set to form the collocation words they had in the reading text. The teacher goes around listening to the teams discussing the words. After few minutes, the teacher asks for volunteers and picks a student to form the first word. The student drags the word 'electric' and drops it before the word 'light' and then she looks at the teacher and says "electric light." The children continue matching the rest of the words successfully.
>
> **(Extract 6)**

Giving the pupils a task like the above in which they select, drag, and drop the words boost the children's knowledge and assist them in retaining the new words and the words that often go together with them especially that these words are presented together in the pupils' textbooks to simplify the learning of the language as it is easier for the brain to learn and remember the language in chunks or blocks rather than as single words.

As for group ABIWB, IWB was used to examine the pupils' spellings of some of the names of endangered animals and inhabitants which they had learnt in the previous period. In this task, the students had to move balls with different letters to form the correct word. At the left hand bottom of the activity the students had a clue which they could click, open, and read to help them recognise the scrambled word. The scrambled words were: aandp, tathaib, sfreot, ,iwkiibrd and ngtanoaru. Students were asked to work in teams and discuss the words among themselves. After 10 minutes the teacher asks Yousif to unscramble the first word.

Once Yousif is in front of the board, he takes a step stool which was next to the IWB and steps on it to reach the balls. He starts by dragging different balls in an attempt to boost his memory and then he pronounces the word panda to the teacher. When the teacher confirms, he starts dragging the letter 'p' and then the 'a' and the 'n' and finally the letters 'd' and 'a'. The teacher asks Ali to go and work on the second word. Ali goes to the board and starts looking at the letters and like Yousif starts moving the balls trying to recall the word and manages to start the word by dragging first ball with the letter 'h' and then the second ball with the letter 'a.' However, he misses by dragging wrong balls which makes his classmates correct him. The teacher tells Ali to listen to her pronouncing the word emphasizing every sound. Hearing the teacher saying the word, Ali starts dragging the ball with the correct letters but misses one letter which his classmates correct. Other pupils manage to form the

three words with no difficulties. However, none of the children raise their hand for the final word. Seeing the children's reaction to the final word, the teacher uploads the picture of the final word which is orang-utan. Once the children see the picture, they realise the word but are still hesitant to go to the board and form the word. The teacher asks two students to go and try forming the word by playing with the different letters. The two boys start dragging different balls; then one pronounces the first letter the other drags the ball with the letter. However, the two stop and then the teacher steps in and puts a letter which seem to make some pupils remember the pronunciation. The teacher steps back and let the pupils help the two boys in arranging the letters correctly.

(Extract 7)

Observing the pupils' joy and enthusiasm in performing the tasks and their persistence in forming the different words and succeeding at such an early age is significant because writing is considered one of the most difficult skills for the Arab learners. Therefore, the young learners' persistent in succeeding may be an indication that in future, these pupils may find writing in English easy.

It was evident to me that IWB's feature of moving and playing with the different images and texts played a role in assisting the pupils' recollection and recognition the vocabulary. The feature also triggered more interaction between the pupils; while the pupils on the IWB were moving the balls, their peers were discussing their moves of each letter and correcting them when they dragged a wrong letter. Although the pupils could not remember the word orang-utan, by uploading an image of an orang-utan on the board, the teacher managed to help the pupils in recalling the word.

Performing similar tasks on a traditional blackboard proved to be difficult and challenging for the pupils of group CB. Like the teacher in Extract 6, group CB teacher

wrote these words on the board which the pupils had in their textbooks: ootbs, eothb, ohnpocs, whals, cjakte, and ath. In teams the pupils discussed the words. Some pupils in two teams can be heard discussing in both English and Arabic. After going around and answering some questions, the teacher asked pupils to go and rearrange the letters of the words correctly.

Individually four pupils manage to go to the board and rearrange the words thobe, hat and shirt correctly. However, pupils face some problems writing the other words. Thus, the teacher starts giving the pupils hints regarding the clothes items to help them. Failing to remember the words, the teacher asks the pupils to look at pictures of these items in their textbooks. Once she does this, some pupils raise their hands and she asks them to go to the board and write the words. The pupils mange to write the rest of the words correctly except the word ponchos, all seem to find it difficult to remember the spelling. As an attempt to help the pupils remember the word, the teacher writes 'Mexico' on the board and asks the pupils to look at a picture in their textbooks of a Mexican boy wearing a hat and poncho and asks them to think of the boy's clothes and the letters of the word on the blackboard. The picture of the Mexican boy seems to help the pupils in recognising the word. The teacher asks one pupil to write the word. Before starting to write the word, the boy says "ponchos" which the teacher confirms and then starts writing the word but stops after writing 'pon'; the teacher asks him to repeat the word to himself but realised that he is still unable to recognise the letters, so she asks the pupils to help him. The children instruct him to write the letters 'c' and 'h' and he manages to write the final two letters 'o' and 's'.

(Extract 8)

Although the teacher here managed to help the children write the words correctly, it might have been easier if she had had IWB in her classroom. This is because the IWB

would have provided her with images of the clothes items without having the pupils opening their textbooks which led some to focus on the textbook but not on the teacher and the blackboard. In addition, having the movement feature in (Extract 7) may have helped the pupils in recalling the spelling of the words as the idea of putting different letters and then removing them could trigger the pupils' memory of the spelling of the word. Furthermore, the pupils were not eager to go to the board and do the task. This was reflected by the number of pupils who raised their hands to participate. This reluctance could be due to their desire of not wanting to leave their seats or their perception that this task was too difficult and demanding.

Nevertheless, it is important to indicate that when looking to extract 7 and extract 8, it is fair to say that not having an IWB in the classroom for such a task may be a blessing for the young learners as without the technology and its features in moving around the letters that may trigger the recognition of the word, the young learners in group CB were forced to work harder in recalling and recognising the words.

4.2.1.1.3. Pupils' behaviour

A final finding that can be attributed to the use of IWB in a classroom is its influence on the pupils' behaviour. This attribute was reported in Higgins et al. (2005) study where a 10 years old boy commented "*The interactive whiteboard improves people's behaviour because they want to go up and write on it"* (p. 859).

Due to the pupils' interest with IWB and its special features, the pupils in groups ABIWB and DGIWB were much focused and all their interaction and dialogue were on their lesson. They were receptive to their teachers and to each other; they listened and followed what their teachers were saying either on the IWB or without and they also

were alert to what was happening on the IWB and helped each other on the board as it was illustrated in previous observation extracts.

In addition, IWB also seem to make the pupils eager to attend school and not to miss any lessons. This was recorded during the days on which I visited the schools as on those days there were no absentees except on one occasion when due to illness two pupils from group DGIWB were absent.

Although groups BG and CB also had no absentees in the classrooms, the pupils' behaviour was sometimes different from that in groups ABIWB and DGIWB. On two occasions some of the pupils in groups BG and CB showed a sign of remoteness and detachment from the classroom as Extract 9 illustrates:

> On a visit to group BG one girl pays no attention to the teacher's illustration of the different celebrations around the world. Although the teacher shows the pupils pictures on the overhead projector, this girl ignores the teacher's illustration and starts looking at some teachers painting the walls outside the classroom. As the lesson continues, another girl from the same team joins her and both continue looking outside ignoring their team members who are reading and answering the questions of a reading task in their textbooks. However, once the teacher comes to their team, the two girls join their team.
>
> **(Extract 9)**

Unlike group BG, the children in group CB showed more challenging disruptive behaviour. For instance, on a visit to this group, a boy kept leaving his team and going to the other team, which made the teacher tells him repeatedly to go back to his team. This kind of behaviour may be related to the group's gender as boys are often known to be more playful than girls. In an ATL Annual Conference release (2011) a head of

department in a primary school in England informed ATL: “classes with a majority of boys tend to be louder, less co-operative and harder to teach” (p.1).

4.2.2.2. Impact on pedagogy

As illustrated in Chapter 1 IWBs’ different features can have impact on pedagogy as with the varied features teachers can select the teaching methods which suit their teaching goals and their pupils’ levels. These features include IWB multi-media, IWB presentational mode and range, and IWB games.

4.2.2.2.1. IWB multi-media

One of the unique features of the IWB is its audio and video features which present teachers with the tool to play audio or video materials to their pupils to enhance their learning and to make it more enjoyable and effective. These features also help teachers in providing authentic learning materials to their pupils. These were evident on a visit to group DGIWB when the teacher used the IWB’s video feature to play a short film demonstrating the process of making a lantern to the pupils.

The teacher goes around checking that all children have coloured paper, scissors, and glue. Next, she tells them to look at the video showing them the process of making a lantern; once she starts the short film, the pupils ' eyes are fixed on the video. When the video finishes, the teacher instructs the pupils to start making their own lanterns. Few pupils however ask the teacher if she could play the video again. The teacher plays it again and once it finishes, she starts going round around the classroom in case anyone needs her help.

(Extract 10)

Besides presenting the pupils with authentic materials which attract their attention, the IWB video feature helped the DGIWB teacher in replaying the video for those pupils who needed to watch it again without preventing her to be free to go around helping the pupils who already started doing their projects. Furthermore, IWB managed also to allow individual pupils to work according to their level thus making them feel comfortable and not feel pressured to work as quick or as slow as their peers. Pupils were all seen working individually on the task, but are helping each other cutting and gluing the shiny papers and interacting with each other and their teacher. Although some pupils were heard interacting in Arabic which is understandable with a project like this, the majority of pupils seem to interact in English using the different vocabularies that they heard on the video; those who seem to find difficulties in pronouncing some words such as scissors, were seen asking the teacher to pronounce the word for them and then practicing saying it themselves. Tomalin (1992) noted that "one of the aims of teaching English is to instil in them [the pupils] the idea that language learning is a happy experience, and video creates an attractive enjoyable learning environment" (p. 48). Hall et al. (2005) also recorded one child commenting on the effects of video, "*You can watch a video clip because you actually pay more attention watching something than just listening* (School 3)" (p. 107).

Different atmosphere was felt on a visit to group CB, where the pupils had the same project that was illustrated in Extract 10. This provided me an opportunity to view the pupils' attitude doing the same activity that seemed to amuse and thrill the pupils of group DGIWB (Extract 10).

The teacher compensates the absence of IWB by using a projector and PowerPoint to show the different steps of making a lantern. The teacher asks the children to look at the slide show which demonstrates the process of making a lantern. Throughout the slide show the teacher comments on the different steps; however, not all pupils pay attention to her as three pupils in the second team on the left start playing with their shiny papers and scissors and four children from the centre team talk to each other. This lack of interest however changes when the teacher stands in front of the whole class and starts cutting and gluing the shiny coloured paper as all pupils start looking at her and few even leave their seats and stand next to her to have a closer look.

(Extract 11)

The contrast in children's concentration on the task in both observations is apparent. The use of video in group DGIWB raised the pupils' interests from the moment the teacher started playing the video which seemed to change the classroom's atmosphere and the pupils' learning experience. However, the absence of the IWB in this group compelled the teacher to use Power Point presentation to illustrate the different steps for the pupils. Although her use of Power Point was not successful to attract the pupils' attention, she managed to regain her pupils' interest by standing and making lantern in front of the pupils who seemed very excited to watch and listen to

their teacher making the lantern; with some pupils leaving their seats and standing next to their teacher to have a better look.

Another multimedia feature that brings the enjoyment factor to the classrooms is the use of the IWB's audio feature which teachers use to play stories and songs for children and young learners in schools. Many young learners' educators assure that songs not only help in adding the enjoyment and fun factor to the classroom, but also "can add interest to the classroom routine and potentially improve student motivation" (Millington, 2011, p. 135). They can also assist young learners' listening skills and pronunciation, hence improving their speaking skills.

During one of my visits the teacher of group ABIWB used the audio feature to play a song which was in the pupils' textbooks and the textbook's software. The aim of the song was to help the pupils recall the new vocabulary that they learnt in previous lessons and to have fun while practicing the language

> The teacher tells the pupils that she is going to play the song that they have in their textbooks and listened while reading the words on the IWB. She reminds them that they have sung the song, so they know it. She tells them to leave their chairs and stand next to her. The teacher switches on the song and shows the words on the screen to encourage the pupils who do not know the words to participate in the singing. She starts singing and soon most of the pupils join her. From the back of the classroom and looking at all the pupils, it was clear that all pupils were enjoying themselves and have no difficulty singing and pronouncing the different words.
>
> **(Extract 12)**

The teacher's singing and dancing with her pupils created a friendly and warm atmosphere. This activity may have also strengthened the teacher's bond with her pupils, and motivated the shy ones to talk freely and join the fun. In addition, listening to the children singing revealed the pupils' pronunciation of the different words and sounds. This explained the good pronunciation of these children which the researcher noted while attending the lessons. It is plausible to assume that this good level of pronunciation may be related to the pupils' exposure to authentic materials such as listening tasks, songs and short films. Improving the pupils' pronunciation of English language sounds at an early age is extremely important as most of the Arab pupils find difficulties in producing some English language sounds such as the p, v, and the g which do not exist in the Arabic language. Thus, mastering the pronunciation of these sounds at an early age can have a huge impact on the pupils' correct use and learning of the English language.

Although the other two groups did not have IWB in their classrooms, they still used the songs in the pupils' textbook to practice the children's use of the language as the following extract from a visit to group BG illustrates:

> The teacher places the CD player on the table and tells the pupils that she will play the song that they have heard and sang before to practice the words in the song. When the pupils hear this, they start smiling and all stand up and leave their seats. They go next to the teacher who inserts the CD in the CD player and plays the song. Once the song starts, the teacher and some pupils start singing. However, not all pupils sing as few of them seem unable to hear the song properly and so start to sing out of tune.
>
> **(Extract 13)**

Despite the majority of children enjoyed singing the song, the use of a CD player produced different audio effects from the IWB. The sound effects of IWB were better and clearer in the big classroom. The poor audio quality of the CD player plus the size of the classroom made it difficult for some pupils to hear the words of the songs leading them to sing out of tune. This lack of harmony took the enjoyment factor from these pupils leading six of them eventually to stop singing.

Having an IWB in a classroom provided teachers with a multimedia machine that transformed lessons making learning a fun experience for the pupils and releasing the pressure of learning a foreign language. Walker-Tileston (2004) explained that children learn best through seeing, hearing and touching; an assertion which was confirmed by the 83 pupils (79.8%) who chose to response positively to question 2 as it was clarified in the first section of this chapter.

4.2.2.2.2. IWB presentational mode and range (screen size and colour)

IWB screen size and its colours influence the pupils in groups ABIWB and DGIWB since all seemed to be mesmerized by the coloured images displayed on the board and the use of colours close to their liking. This was felt through their reaction; whenever the teacher displayed an image or used different colours for the texts, the pupils always made comments in Arabic such as "هذه صورة جميله معلمه" (translated: that is a beautiful picture, Teacher) or commented in English "*teacher, we like the red that you used for this word,*" and "*teacher, please don't use the black colour*". It was apparent that this feature kept the pupils excited and focused on the screen and on their teachers.

This fascination with colours was also noted whenever the pupils were asked to perform a task on the IWB seeing that they often changed the colour of the font to their liking as illustrated in Extract 1. The IWB's size also played a role in capturing the pupils' attention and enabling them to see the written text and images from their seats even if they were seated at the back of the classroom. Moreover, the board feature of resizing the font allowed teachers to enlarge text or words when these were not visible to pupils sitting at the back of the classrooms or having sight problems. On some occasions when this happened, some enthusiastic pupils asked their teacher if they could make these changes instead of her which was a delight to see (Extract 2).

Cunningham et al. (2003) pointed out that the visual aspect of IWB were particularly valuable in keeping the pupils focused and on task. He reported a teacher commenting that the children were amazed with the IWB visuals and that it helped in grapping their attention especially the fidgety ones. The teacher also commented on the IWB's size and said that its big size enabled everyone to see.

In addition, the IWB feature of moving text and images across the board also meant that the teacher could move and place the text and the image at any place on the board to accommodate the pupils' inability to view them or to reach them. This was perceived during my visits to both ABIWB and DGIWB groups.

4.2.2.2.3. IWB games

Through my brief discussion with the teachers about the textbooks, all teachers stated that games are considered an important aspect in their teaching and that their textbooks include some games to be used in classrooms. They indicated that they usually use games in the final three periods when some of the pupils are tired.

Through the IWB, the teachers of groups ABIWB and DGIWB managed to use games to motivate the pupils and to embrace their love for playing games. In my visit to group DGIWB the teacher used a spinner game. The teacher employed this game to recycle the vocabulary that the pupils had learnt in some earlier units. She divided the spinner into four sections; each section had a category that the pupils had in their textbooks: These were illnesses, hobbies, occupations, and animals past and present. Each pupil had to go and whirl the spinner and then give an example of the category the arrow pointed at. Although this game was a bit challenging, the pupils seemed to enjoy it as Extract 14 shows:

The teacher stands in front of the classroom and asks the pupils *"who wants to go first?*" pupils stand and some shout the name of the teacher asking her to choose them to start the game. The teacher chooses Aisha who goes and whirls the spinner and it lands at animals past and present for which she gives the lion as an example. The teacher then asks Fatima to spin. Fatima spins and it lands on illness; she stops and starts looking at the board. Her friends shout "flu" but she ignores their answer and says *"toothache!"* The teacher praises her and she returns to her seat smiling while the pupils are cheering her. More pupils go to the IWB, spin, and guess the answer; few pupils struggle with an answer but the majority of pupils manage to give an answer.

(Extract 14)

The game was very entertaining as all the pupils were laughing and giving different answers. In addition, it was a great way to revise their knowledge of the vocabulary which they had learnt. The teacher managed to orchestrate the game and the class brilliantly. The nature of the game allowed many pupils to go to the board and to play as there was no limit to the number of vocabulary words that the pupils could

come up with. The activity also managed to involve all of the pupils as some were clapping, cheering and shouting the answer to their friends.

Group ABIWB teacher also conducted a game testing the children's knowledge of the vocabulary; in this game the children had to tap on a box to reveal a picture which they had to match with its vocabulary:

The teacher starts by asking for a volunteer. She chooses Ahmed to come to the IWB. Ahmed smiles at the teacher and goes and taps a box which shows the word dinosaur. Looking at the word, Ahmed seems uncertain of it. Observing Ahmed's reaction the teacher realises that he does not know the word. Thus she pronounces the word to him *"dinosaur!"* Once the teacher says it loudly Ahmed smiles and few pupils can be heard saying "!*او ديناصور*" (translated: oh dinosaur)

Ahmed taps one box but does not get it, so he taps another one but the image is of an alligator. He then asks the teacher if he could tap a third image. The teacher approves and he taps another but gets the word blue whale. All pupils' eyes are fixed on the IWB trying to remember the position of the images and the words. Ahmed goes back to his seat and then the teacher asks another pupil to come and tap a box. He goes and taps a box revealing the image of a dinosaur. He looks at pupils and asks "*وين الصورة؟*" (Translated: where is the picture?). All the pupils tell him which box to tap and he finds the matching word. Next, the teacher asks Abdullah to come to the IWB. He goes and taps a box reflecting the image of a dodo. Like Ahmed, Abdullah stands looking at the word trying to pronounce it. The teacher steps in and says *"dodo"* loudly for all the pupils to hear. Abdullah smiles and looks at the boxes and then taps a box reflecting the image dodo. All his peers seem surprised that he got it quickly and ask him; "اشلون عرفتها؟" (translated :How did you know it?) He says "ما ادري" translated: don't know!), and smiles.

The pupils continue doing the task and all seem happy and enjoy tapping the different boxes and matching the pairs up.

(Extract 15)

When the words *dinosaur* and *dodo* were pronounced by the teacher, Ahmed and Abdullah's reaction clearly indicated that it was not easy for them to understand. The inability of the written form of these words led them to seek their teacher's help. The teacher hence pronounced the words in Arabic (the translation method), which

made them understand the words quickly. This is because *dinosaur* and *dodo* are pronounced the same in both Arabic and English language.

Various young learners' scholars agree on the role of the games in transforming the learning process and making it fun. Besides adding the fun factor, by playing games in the classroom "students can be familiar with classmates by exchanging their feelings while playing games, they can feel comfortable in their classroom" (Atake, 2003, p.12). Extract 15 confirms this, as all pupils were relaxed and comfortable performing the task and none of them were hesitant to participate or worried about giving wrong pronunciation.

Groups BG and CB teachers also used games to recycle and revise the vocabulary. In group CB's classroom, the teacher used a crossword game which the pupils had in their textbooks

The teacher asks the pupils to open their workbooks and in teams try to do the crossword that they have on page 57. While the pupils are doing the crossword, the teacher draws the crossword on the blackboard. After that, she goes round checking if any team needs assistance.

In teams, all the pupils seem to enjoy doing the crossword, interacting, and guessing the words. One team asks *"Teacher, can we look up the words in our books?"* The teacher refuses their request and assures them that this is only a game and that they need not worry. The teacher gives the pupils

30 minutes to do the game which seemed insufficient as at the end of the time one team fails to finish the game. The teacher asks pupils from all the teams to come to the blackboard and write the words in the squares. However, the bell rings before the teacher manages to fill all the words with the pupils.

(Extract 16)

Although the children in group CB appeared to be having fun and were excited with the crossword, the atmosphere was very competitive as members of two teams were heard saying "لازم انخلص ونغلبهم" (translated: we have to finish and beat them) and this in my point of view may take the fun factor that a game was supposed to bring into the classroom.

Group BG teacher used 'Hangman'; a game which all pupils knew; however, as Extract 17 how few pupils lost interest in this game after some time.

The teacher puts the two categories 'animals' and 'hobbies' from which the vocabulary belong to on the left side and asks the pupils which category they want to do. The pupils shout "*hobbies"*, so the teacher draws two rows of dashes indicating that the required word consists of two words. Pupils discuss the task in teams. The pupils raise their hands indicating that they are ready. The teacher asks one girl from the first group to write the word. The pupil writes the first word "playing" but fails to write the other word. This makes the teacher starts drawing the head of the man; she asks another pupil to give her the first letter of the second word, The pupil tells 'G' and the teacher starts drawing the torso of the man. Next, two pupils from a team at the rear of the class raise their hands and say "*playing football*". The teacher tells one of the pupils to come forward and write the word. The pupil goes and writes it correctly. The teacher smiles and erases her drawing and gives the rear team a point.

The teacher continues with the game giving the pupils more words to guess; however, the pupils fail to guess the words 'planting' and 'musician' correctly. A shift in the pupils' attitude towards participating in the game is sensed. Few pupils stop participating and instead start talking to each other and paying no attention to the game. The teacher tries to include these pupils in the game but the pupils' attitude does not change which eventually forces the teacher to stop playing the game after the fifth word.

(Extract 17)

The pupils' change of attitude in Extract 17 could be attributed to the difficulty that the pupils felt in guessing the words or to the teacher's need to erase the board after each word. Although young learners as Halliwell (1992) explains love guessing games, the young learners in BG group did not seem to enjoy the guessing game that their teacher chose. This could be due to the young learners' use of electronic games making them less interested in playing games on the traditional blackboard. This puts a

huge pressure on teachers with a traditional board in their classroom as they must always be careful of the kind of games they choose to play because, as explained in Chapter 1, children get bored quickly.

Yáñez et al. (2010) in their study on the use of IWB in an ESL immersion classroom revealed that all the children in their study "mentioned that they liked playing games on the board. Children from all three groups [Spanish speaking children, English speaking children, and Spanish-English bilingual children] mentioned that the IWB contributed to lessons in terms of making them more fun and enjoyable" (p.3). They cited a non-native speaker of English saying "I like it because we can play lots of games and we can learn at the same time." Another said "I like the multiplication games because I can learn the times tables very easily, if we did not have the IWB it would be boring and harder to learn" (ibid).

4.2.2.3. Interactional affordances

The term 'affordance' is used here to mean "the strengths and weaknesses of technologies with respect to the possibilities they offer the people that might use them" (Gaver, 1991, p. 79). IWBs have different features that play a big role in motivating and changing the learning experience of the pupils. Under this theme there are two sub-topics: the students' use of and control of the IWB and the lesson's pace.

4.2.2.3.1. The pupils' use and control of the IWB

Throughout my observation of groups ABIWB and DGIWB the pupils' realization of IWB was exhibited in their use of its various features and in their control and

manipulation of texts and images as it was illustrated in the different extracts. This knowledge may have gradually developed in these pupils since they have had used IWB from grade 1. It may also be due to having IT literate teachers. During a visit to ABIWB group some of the pupils loved using the board features and exploring its various uses:

> The teacher asks a student to go to the board and write the correct word in the space and complete the sentence. He goes and writes birthday. He then clicks IWB tool bar and clicks the line style and thickens the line. Next Naser clicks the pen icon and changes the color of the word from red to green. The teacher praises him and he goes back smiling to his seat. The teacher asks Bader to go next; Bader goes and writes the word sweets, but then looks at the word and realizes it is smaller than the other words, so he resizes it. He then asks if the teacher can help him upload a picture of sweets from the textbook software. The teacher agrees and tells him to click on a file. Some pupils go and stand next to the IWB to have a better view. The teacher shows him and the class how to upload a picture. Then she asks him if he wants to drag it and drop it next to the word, which he does.
>
> **(Extract 18)**

Although the majority of pupils showed confidence and skill in using the IWB, few have shown limitation in their skill, but this did not stop them participating in the activities on the board and even asking the teacher to teach them how to use new features of IWB. Their limitation did not also deter them asking assistance from their peers and their teacher. An example of this was noted in Extract 19 from a visit to group DGIWB and like the rest of the observation extracts all the communication between the pupils and the teacher is in English except the one that is written in Arabic:

In an activity that requires the pupils to drag some balls with letters to form a word, the teacher asks Fay to come and drag a ball but she seems to forget how to drag an image on the board therefore she looks at the teacher and says "*Teacher*" indicating that she needs help. The teacher intervenes and shows her how to do it and steps back. The student continues having difficulties which makes the teacher step forward to help her but the student says *" بس معلمه خليني اسحبها! اعرف"* (translated: Enough Teacher! Let me drag it! I know) Thus the teacher steps back and lets her complete the task.

(Extract 19)

Fay's persistence in working on the board and asking her teacher's assistance more than once echoed in previous illustrated extracts such as Extract 1 which signals the pupils' fascination with IWB. Considering the pupils' age (8-9 years old) it is really encouraging to see such an approach especially as young learners at this age are known to be shy and sensitive.

Besides showing persistence to mastering the skill of using the IWB, the pupils also exhibited confidence in using the board. As the researcher was informed by the teachers of groups ABIWB and DGIWB, the confidence and technical competence that the pupils display come from using the IWB at an early age as all the children, including groups BG and CB, have had the IWB from Year 1. It was only in Year 5 that some pupils such as groups BG and CB and others in some schools lacked having the technology in their classrooms. This could clarify the responses that all the pupils gave to the questionnaire's questions especially question 9.

4.2.2.3.2. The pace of the lesson

One of the benefits that were reported in some studies investigating IWBs' role in teaching is its ability to recall any activities from the textbook's software or any software that works with a personal computer. This as Cunningham et al. (2003) explained makes teachers spend no time in writing activities on the board thus "quickens the pace of lessons and engages the whole class more" (pp 16-17). Levy (2002) asserted that one of the main advantages of IWB is that it relieves teachers from spending ample time writing or drawing activities on the board as with IWB most of the activities and drawings are already built into the board and are accessible from the IWB 'library'. This assists in quickening the lesson's pace and maintaining the pupils' interests' especially with young learners who have a short attention span. Kang Shin (2006) affirms that it is a good idea to move quickly from activity to activity and not to spend more than 10 or 15 minutes on any one activity because children tend to become bored easily and as they get older their ability to concentrate for longer periods of time increases.

The IWB influence on the lesson's pace was recorded on a visit to group DGIWB. During this visit the teacher was able to use two kinds of vocabulary activities. The first activity was a matching activity in which pupils were given words and were asked to decide which of these words is related to sight, sound, smell, and touch. Pupils had to select a word and drop it under the correct column. After doing this task, the teacher asked the pupils to do a task in which the pupils had to reorder the sentences of a paragraph which included all the new vocabulary they studied. Although the task was a bit challenging, the pupils seemed to enjoy moving all the sentences on the IWB. The interaction that took place between the pupils who were selected to do the task and the

other pupils was very lively as it involved all the pupils and their teacher as Extract 20 shows:

> After dragging the first sentence and dropping it at the beginning of the paragraph, the two pupils in front of the board start talking to each other. One of them starts dragging another sentence, the other looks at the sentence and realise that it is not the correct one. He shouts “no not this one!” The two pupils start talking to each other and then ask “which one?” to the rest of the pupils. The pupils tell them which sentence. Before dragging it, one of the two pupils asks the teacher if it is correct. The teacher asks the pupils why they chose this sentence. A student from a team at the back of the class goes to the board and points to a word and when the teacher confirms her answer, she goes back to her seat. Next, one of the two starts dragging it and dropping it next to the first sentence. The teacher asks the two girls to go back to their seats and select another two girls from another team to choose the third and the fourth sentences.
>
> **(Extract 20)**

Throughout this activity the classroom was dynamic and the interaction between them and their teacher was smooth as all pupils were standing looking at their classmates performing the task, encouraging and correcting them. The fact that more than one student can join in performing a task on IWB is valuable especially for young learners classrooms because it encourages teachers to merge shy pupils with the outgoing ones who will encourage shy pupils to participate more in the classrooms. In addition, it was uplifting to see pupils at a young age eager to participate in a writing task and make the logical connections between the different sentences in terms of syntax and semantics. After the class ended the teacher informed me that the pupils like

doing activities that require rearranging texts, words, or images because they view these activities as puzzles. She also commented that pupils never complain of the number of activities they perform as long as it was done on IWB.

Nevertheless, some researchers claimed that accessing various resources and performing activities more quickly, may leave pupils unable to comprehend everything that their teachers give them. Schmid (2008) argued that since teachers can access materials and perform activities more quickly "the students may end up being ''bombarded" with too much information and may be exposed to more stimuli than in a traditional lesson, without being given enough time to ''digest" or interact cognitively with those stimuli" (p.1562). Though this may be true with some pupils, such view and claim were not noted while visiting ABIWB and DGIWB groups.

4.2.3. The study's third question

What is the effect of IWB's use in teaching the new vocabulary on the children's vocabulary achievements?

This part of the study presents the results of the pre-test and post-test. The purpose of this study was to investigate the influence of IWB on the pupils' vocabulary achievement. Hence, it was essential to examine their school records and obtain a previous vocabulary test scores which the pupils took when all groups were taught by IWBs to be considered as a pre-test and compared with Year 5 vocabulary test score. In order to have a test similar in content and difficulty to Year 5 test, I chose to analyze Year 4 final year vocabulary test which was designed under the supervision of the

English language supervisors at the Ministry of Education and the senior teachers in schools.

Year 4 test consisted of four sections: reading, grammar, vocabulary and writing; each with its own marking. For the purpose of this study only the vocabulary section grades of all the pupils were used and analyzed. As for Year 5 test, as explained in Chapter 3 the vocabulary test was conducted with the help of the participating teachers

4.2.3.1. Tests analysis

Kruskal-Wallis test was used because the scores of three groups were not normally distributed. Three conditions were compared: pre-test scores and post-test scores (with IWB), pre-test scores with of post-test scores (without IWB), and post-test scores (with IWB) and post-test scores (without IWB). The results will be presented and discussed in the following sections.

All the students tested prior to the experiments were generally taught with the use of IWB. The mean scores of these groups shown in table 4.10 indicate that the scores of the students in the vocabulary post-test (mean rank = 118.54) are slightly higher than in the pre-test (mean rank = 111.99). This is not unexpected as the use of IWB in the experiment was done rigorously with the intension of investigating its effects. The effect of the use IWB is further confirmed by the scores of the group of students with whom no IWB was used; the mean rank is at the bottom of the three groups (mean rank = 75.49).

	Groups	N	Mean Rank
Students' Scores	Pre-test	104	111.99
	Post-test with IWB	52	118.54
	Post-test without IWB	52	75.49
	Total	208	

Table 4.12: Mean rank of the three groups

Kruskal-Wallis results are shown in table 4.11. The statistics indicate clearly that there is a significant difference in the mean scores of at least two of the three groups; ($H(2) = 17.102$, $p < 0.000$).

	Students' Scores
Chi-Square	17.102
df	2
Asymp. Sig.	.000

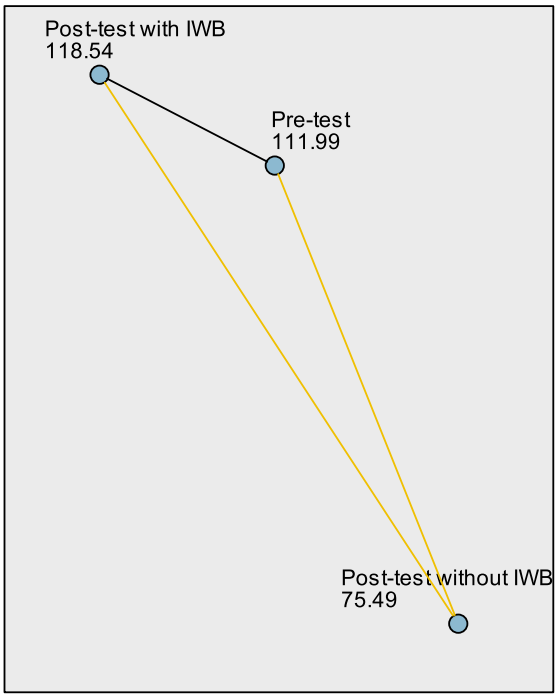
a. Kruskal Wallis Test

b. Grouping Variable: Groups

Table 4.13: Kruskal-Wallis Test of the difference between the scores of three groups

The post hoc tests to test pairwise comparisons available at SPSS (IBM 20) were used to find out where the significance difference lies (table and figure 4.12). It was found out that the mean score in the post-test of the group with which IWB was used is significantly different from the mean score of the post-test of the group with which IWB was not used ($p = 0.001$) and also between the mean scores in post-test without IWB and the mean score of pre-test ($p = 0.00$). In contrast, the results showed no significant difference between the mean scores in the post-test with IWB and pre-test ($p = 0.514$).

Pairwise Comparisons of Groups



Each node shows the sample average rank of Groups.

Sample1-Sample2	Test Statistic	Std. Error	Std. Test Statistic	Sig.	Adj.Sig.
Post-test without IWB-Pre-test	36.495	10.046	3.633	.000	.001
Post-test without IWB-Post-test with IWB	43.048	11.600	3.711	.000	.001
Pre-test-Post-test with IWB	-6.553	10.046	-.652	.514	1.000

Each row tests the null hypothesis that the Sample 1 and Sample 2 distributions are the same.
Asymptotic significances (2-sided tests) are displayed. The significance level is .05.

Table 4.14: Multiple comparisons of the mean scores of three groups

The result of the test was expected as several studies conducted on the effects of IWB on the pupils' achievements have reached similar conclusions as this one. Lewin et al. (2008) noted that children aged 7-11 showed positive improvements in literacy, mathematics, and science. These achievements were directly related to the length of

time in which the children were taught by IWB. Marzano's study (2009) "indicated that, in general, using interactive whiteboards was associated with a 16 percentile point gain in student achievement" (p. 80).

Pupils' Year 5 test answer sheets were further investigated and it was indicated that almost all pupils in all groups had no problems in answering the first question in which was a matching task; pupils had to identify the words and match them with their pictures. Having the pictures and the words may have triggered the pupils' memory hence making the matching process easy. Scholars of young learners such as Cameron (2001) and Pinter (2006) confirm this assumption as they both emphasize the role of different media such as pictures to assist in memorizing and recalling vocabulary and information.

Pupils' performance in the second question however suggested that many of student from both groups found the second question challenging. This challenge could be related to the nature of the question as in this question the pupils were given only pictures depicting certain hobbies and they were required to recall the name and the spelling of each hobby and to write it under its picture. This demanded extra effort from the pupils. Although these words were part of the key words that the pupils at this stage were expected to know, almost all pupils had difficulties in recalling and writing the names of the hobbies correctly.

Examining the pupils' papers, I found that 4 pupils from groups BG and CB and 1 student from group ABIWB did not make any attempt in answering the second question and left it blank; 10 pupils from groups BG and CB and 4 pupils from groups ABIWB and DGIWB managed to recognise the name of the hobbies but failed in writing the correct

spelling of these words. These results suggest that pupils in all the groups need more spelling practice. During the researcher's visits, it was noted that teachers gave various vocabulary tasks which were all aimed at improving the pupils' knowledge and recognition of the vocabulary but very few tasks aimed at improving or teaching the spelling of vocabulary (Extracts 6 & 7).

In addition, teachers must give the pupils sufficient tasks that enhance their memory. "Memorising activities are needed at the point of learning new words for the first time, and at regular intervals to recycle vocabulary, so that it stays active and ready to use" (Cameron 2001, p. 87).

4.3. Summary

This chapter presented the analysis of the data collected by the study's three research tools. The chapter has three sections. The first section dealt with the analysis of the questionnaire questions which findings answered the first question of the study and showed the positive perceptions that the young learners held towards the use of IWB. The positive attitude also assisted me in understanding the young learners' comments and gestures that I observed in the classrooms and the energetic classrooms' atmosphere.

The second section illustrated the analysis of the observation's data which findings corresponded with the study's other questions. The significance of observation is that it provided me with a first-hand account of the pupils' and the teachers' use of IWB and an insight of the interaction that occurs inside the classroom. I had the opportunities to listen to all the comments that the pupils said to each other and to their

teachers. It also provided me with an understanding of all the positive responses that was recorded in the questionnaire's questions as I got to see all the encouraging gestures that pupils did for each other and the reaction on their faces when succeeding in doing a task on the IWB; gestures and comments that would have been impossible to realise if only the questionnaire and the test were employed in the study.

The third segment of the chapter represented an analysis of the influence that IWB has on the pupils' vocabulary achievement. The analysis of the vocabulary test that the pupils had in Year 5 has shown difference between the two groups. On the other hand, there was no difference when I analysed the vocabulary test that all the children took when they were in Year 4 when they all were taught by IWB. This finding supports the claim that IWB plays a role in developing and enhancing the learning process hence enabling learners to achieve high academic scores. This may raise concern to what effects will the absence of IWB have on the pupils' level if the pupils in group BG and CB continue their schooling without IWB as their responses to the questionnaires' questions reflect their awareness of the IWB effects on them and on their learning.

The findings of this study confirms that whilst there are in IWB literature studies such as Ajelabi (2015) with controversial findings regarding the impact of IWB on learner's achievements, this study and other studies such as Beauchamp (2004); Higgins et al. (2005). Yáñez et al. (2010) and Gregory (2010) hail the IWB role in boosting the learner's learning. However, the fact that this study was conducted in Bahrain and on a small fragment of pupils, it is essential to remember that, like the majority of the studies discussed above, its findings cannot be generalised.

CHAPTER V

CONCLUSION

5.1. Introduction

The final chapter will explain first the limitations of this study. The chapter will also present the study's contribution to the IWB literature and its implication. The final part of this chapter will be dedicated to recommendations.

5.2. Limitations of the study

It is essential to remember that this study was conducted in Bahrain and in two areas with a small sample thus the results of this study cannot be generalized. Furthermore, since all Bahrain schools were scheduled to do the yearly National Tests during May and the final examinations at the end of May, I was compelled to start and finish my observation in April. This time limitation deprived me the opportunity to interview the children especially group ABIWB and DGIWB pupils.

It is possible that interviewing the pupils especially those who had IWB in their classrooms and chose unexpected responses would have presented different interpretation for the data. For example, it would have been interesting to know why 2 pupils in group ABIWB indicated their uncertainty when asked if they enjoyed learning when the teacher used IWB (question 5) or why 2 pupils in the same group chose

similar response when asked whether they understand the lesson when teacher uses IWB video and audio feature (question 2) which is surprising as the use of videos and audio materials are known to have a huge impact on the children's learning and their attitudes in classrooms.

In addition, unexpected positive responses from the pupils of the other two groups who did not have the technology in their classrooms and yet agreed with all the questions are also intriguing and interviewing them and discovering the reasons for choosing such response would have added insight to the comments and the requests that I encountered during my observation.

5.3. Contribution to IWB literature

This study contributed to the literature of IWB in two areas: (a) the contribution to the IWB literature in general, and (b) the contribution to IWB literature in Bahrain and the Arabian Gulf.

5.3.1. IWB literature in general

As mentioned earlier in the literature review, when I started examining the literature on IWB I noticed that there were various studies on IWB investigating the teachers' perception and attitudes. Although there are studies in the IWB literature on IWB effects on children's enjoyment, motivation and participation, there are very few studies describing the children's views. Researchers such Murphy et al. (2003) pointed out this lack of sufficient studies thus it is believed that this study with its findings that reflect the children's views on IWB may help slightly in filling the gap.

As there are conflicting studies in IWB literature regarding the impact IWB on the pupils' test attainment, this study with its results and its statistical analysis of the pupils' tests scores provides a current study examining this aspect and although its findings may not be generalized, it is a contribution for the IWB literature.

5.3. 2. IWB literature in Bahrain and Arabian Gulf

Besides filling a gap in the IWB literature, this study may enrich the literature on teaching and learning English in Bahrain because it is the only research that has examined the IWB's effects on children's English vocabulary achievement and their attitudes towards learning the language by IWB. Despite having this technology in schools for 12 years, there has been no studies examining the effects of IWB on teaching or learning English language either in government or private schools; making this study significant to Bahrain Ministry of Education scholars and teachers of English language teaching in Bahrain.

In addition, scholars in the Arabian Gulf or scholars who are interested investigating the effects of IWB on the children in the Arabian Gulf region could find this study interesting as most children in this region have similar characteristics and similar English learning problems. While examining the literature on the IWB's use I came across few studies conducted in the Arabian Gulf and all were conducted in Saudia Arabia however these studies such as Al-Faki et al. (2014) study and Gashan et al. (2015) study were all examining teachers' perception and use of IWB. Having studies highlighting only teachers' use and perspective of IWB indicates that there is a need for studies like my study which tackle the learners' opinion and use of the IWB.

5.4. Recommendations

Having visited the schools and seen what can IWB do to the classrooms' atmosphere and the pupils' learning process in the primary stage, it is important that Bahrain Ministry of Education provides all primary and intermediate schools with IWB because at the moment there are very few number of schools which lack this technology.

In addition, the Ministry of Education in Bahrain must revise its policy in introducing new teaching and learning technology to schools. It seems unfair and ethical that pupils that were selected to take part in the trial period of a project are derived from the technology once they are transferred to a higher grade or level such as what happened to group BG and group CB. During my observation, the young learners in both groups asked their teachers to take them to a classroom with IWB. This was heartbreaking especially that almost all of them had friends in classrooms which had the technology. In my opinion, when commencing a project, the Ministry of Education must start implementing it in all the classrooms in the selected schools. This would assure that the pupils who are used to have certain technology will not be deprived from it because they have been transferred to a classroom in higher grade or level which is not included in the experimental classrooms.

The Ministry must also assure that all teachers are ICT literate. One of the advantages of sitting in ABIWB and DGIWB classroom was that it enabled me to

perceive the confidence that the teachers showed using the interactive whiteboard. This confidence reflected on their pupils who demonstrated similar confidence and did not mind going to perform a task on the IWB or ask for their teachers' assistant.

All teachers must also be trained on how to produce and design their own IWB activities. This will help them in being less dependent on the activities that are installed on the IWB software and the publishers' websites. This would enable teachers in developing and creating activities that are more tailored to their pupils' level and interests. It would also assist in developing and improving the teachers' resources website which provides support to all teachers especially the new employed ones. Having a bank of resources for all the subjects will also encourage teachers of all subjects to use the technology more.

Teachers should also be provided with regular training sessions specially that technology is developing and new software are being created and produced regularly. Teachers must be in tune with their pupils' mentality that sees technology as the coolest trend in teaching thus prefer having it in their schools especially that they spend most of their days in schools.

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Appendix

Appendix 1: Syllabus for Basic Education in Bahrain government schools.

Version B. Cycle 2.

By the end of cycle 1 learner will be able to operate at a good basic level with reference to the following areas of the syllabus:

	Information	opinions
Grade 6	Share detailed information on a specific topic.	Express degree of probability and certainty Express satisfaction and dissatisfaction
Grade 5	Describe and compare objects, people and places, share information about events in the past and future	Express agreement and disagreement Express interests or lack of interests
Grade 4	Describe a sequence of events in a story Describe location Sharing formation on familiar classroom topics	Record and share thoughts and feelings, for example in self-assessment tasks Express a personal response to a variety of situations Express and ask questions about likes and dislikes

Language competence

Grades	Listening	Speaking	Reading	Writing
Grade 6	Identify topic of discussion when it is articulated slowly and clearly Understand (and respond to) questions about themselves, their daily needs and familiar topics.	Talk about themselves, their daily needs and familiar topics in both rehearsed and spontaneous situations Respond to questions about themselves, their daily needs, and familiar topics. Use a range of classroom language	Understanding and identify specific information in basic range of text types such as instructions, menus, lists, personal letters, recipes, poems, emails, postcards, timetables, advertisements, articles, brochures, stories	Write simple phrases and linked sentences about familiar topics and mange a limited variety of text types such as personal letters, projects, lists, emails, cards, messages, descriptions Write legibly in cursive script and use accurate

				punctuation and spelling.
Grade5	Understand and extract the general idea and /or specific information from short recorded passage dealing with familiar topics when they are delivered slowly and clearly	Employ pronunciation at a reasonable level of accuracy Interact with reasonable ease in structured situations and short conversations and manage routine exchange.	Employ, when guided, the skills of skimming and scanning appropriately to facilitate understanding of a text. Underhand high frequency/international signs and notices	Write simple phrases and sentences about familiar topics and manage a limited variety of text types such as postcards, cards, descriptions, stories Employ the basic techniques of process writing when working on texts such as projects or stories.
Grade 4	Understand (and respond to) formulaic questions about themselves, their daily needs and familiar topics. Understand and follow simple directions for example to find a place on a map Understand very simple, short, repetitive stories.	Talk about themselves, their daily needs and familiar topics using isolated phrases and simple formulaic expressions Request clarification and repetition Tell simple stories	Understand very short, simple texts with visual support on familiar topics such as instructions, poems, postcards, stories.	Write simple isolated phrases and sentences and manage a limited variety of texts types such as postcards, cards, descriptions, stories on familiar topics. Write very short, simple, formulaic sentence level texts on familiar topics. Use full stops and capital letters appropriately.

Strategies: Learners at this level will need some guidance from teachers to employ and understand the usefulness of these strategies

Grades	Cognitive	Social/affective	Met cognitive
Grade 6	Find information using reference materials and technical aids.	Plan and work through tasks with other learners Provide supportive feedback to others, for example peer correction	Evaluate their learning or those of others (self/peer assessment
Grade 5	Associate new words with previously learned, for example word building Plan ahead how to approach a simple learning task	Participate actively in lively and more focused learning activities Show a willingness to take risks and try different tasks and activities.	Reflect with others on listening, reading, writing, process, for example when Editing a written text (process writing0
Grade 4	Classify language into groups, for example lexical sets Make simple choices about activities and tasks Begin to use language creatively.	Work effectively in pairs and groups Participate in group reading activities Reflect on learning experiences	Talk about their work with others.

Global Citizenship

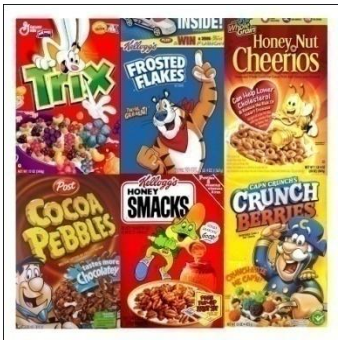
Grade 6	Concept of Citizenship: human context, belonging, royal, unity, independence,. Life Skills for Citizship: participation. Co-operation, critical thinking Preserving Heritage: positive traditions and values Duties: conserving and developing recourses, saving the environment.
Grade 5	Concept of Citizship: human context, belonging, loyalty, unity, independence Life Skills for Citizenship: participation. Co-operation, critical thinking Preserving Heritage" positive traditions and values Duties: Conserving and developing resources.
Grade 4	Concepts of Citizenship: human context, belonging, loyalty, unity Life Skills for Citizenship: participation. Co-operation Preserving Heritage: Positive traditions and values Duties: conserving recourses

Appendix 2 Ability test for grade 5

A. Look and match a word or words from the box with its picture.

Cereal	upset	curly hair	ride a bike	toothache	brush teeth

_____ _____



_____ _____

_____ _____

B. Look at the pictures. Name each hobby.

_____

_____

_____

_____

Apendix3 Students' attitude questionnaire

Dear students read the following questions and put (X) under the picture that applies to your attitude regarding *Interactive white board* use.

Questions	I agree 	I disagree 	Don't know 
1. I learn more when my teacher use the Interactive whiteboard			
2. I understand the lesson when my teacher uses the pictures, videos and sounds on Interactive white board			
3. I concentrate more on the board when my teacher uses interactive white board.			
4. I participate more when my teacher uses Interactive white board .			
5. I enjoy learning when Interactive whiteboard Is used.			
6. I prefer the lessons that are taught with Interactive whiteboard.			
7. I am happy when I use Interactive white board.			
8. I am happy when my classmates see my answers on interactive whiteboard.			
9. Using interactive whiteboard is easy for me.			

P.S. this version was <u>NOT</u> given to the children.

Appendix3 (the questionnaire in Arabic which will be given to the students)

استبيان لمعرفة اتجاه التلاميذ نحو السبورة الذكية

حبايبي التلاميذ الرجاء وضع (χ) تحت الصورة التي تعبر عن رايكم . ..... وشكرآ

الاسئلة	اوافق 	لا اوافق 	لا ادري 
1) اتعلم اكثر عندما تستخدم معلمتي السبورة الذكية			
2) افهم الدروس عندما تستخدم معلمتي الصور و الفيديو والصوت علي السبورة الذكية			
3) اركز اكثر في الدرس الذي علي السبوره عندما تستخدم معلمتي السبورة الذكية			
4) اشارك بصوره اكثر عندما تستخدم معلمتي السبورة الذكية			
5) استمتع با الدراسة عند استخدام السبورة الذكية 6			
6) افضل الدروس التي تدرس من خلال السبورة الذكية			
7) افرح عندما استخدم انا السبورة الذكية			
8) افرح عندما يشاهد زملائي اجاباتي علي السبورة الذكية			
9) استخدام السبورة الذكية سهل علي			

Appendix 4: Observation sheet

School:_____ Date of observation:_____

Teacher:_____ Lesson:_____

Tick the time in which the teacher used IWB

First 5 min.	10 min.	20.min	25 min.	30 min.	35 min.	40 min.	45 min.

Tick according to the teacher's use of IWB

Aims and objective of the lesson:

_____

_____

_____

Teaching tools/ software used:

_____

_____

_____

_____

_____

_____

General observation notes or comments regarding teaching/ teacher's efficiency/student's interaction with each other and with their teacher/ classroom atmosphere in general:

_____

_____

_____

_____

_____

_____

_____

Kingdom of Bahrain
Ministry of Education
Secretariat General of the Higher Education Council
Scientific Research Directorate

مملكـــــة البحريـــــن
وزارة التربيـــة والتعليـــم
الأمانة العامة لمجلس التعليم العالي
إدارة البحث العلمي

الرقم: ١/٤/ت م ب
التاريخ: ٢٣ فبراير ٢٠١٤م

الأستاذة الفاضلة إيمان إبراهيم عبد اللطيف الدوسري المحترمة

تحية طيبة وبعد،،،

الموضوع: الموافقة على تطبيق أدوات بحث بإدارة التعليم الابتدائي

بالإشارة إلى طلبكم المقدم بتاريخ ٢٠١٤/٠١/٢٦م بشأن تطبيق أدوات البحث المعنون:" تأثير السبورة الذكية على التحصيل العلمي للكلمات الجديدة بمادة اللغة الإنجليزية للصف الثالث ابتدائي"، يسرني إعلامكم بموافقة الإدارة / الإدارات المعنية على تطبيق أدوات البحث وفق التعليمات والشروط التالية:

١. الالتزام عند التطبيق بأداة / أدوات البحث التي تمت الموافقة عليها دون إضافة أو حذف.
٢. المحافظة على المعلومات التي يتم جمعها، وعدم استخدامها إلا لأغراض البحث العلمي.
٣. تزويد إدارة المكتبات العامة بوزارة التربية والتعليم بنسخة من البحث بعد الانتهاء منه.
٤. جميع الإجراءات والخطوات اللازمة لتطبيق أدوات الدراسة تقع على عاتق الباحث نفسه ولا يحق له الاعتماد على كوادر الوزارة لأداء هذه المهمة.

مع تمنياتنا لكم بالتوفيق، وتفضلوا بقبول خالص التحية والاحترام.

د. فرزانة عبد الله المراغي
مدير إدارة البحث العلمي

هاتف : ١٧٨٧٣٠٦١ (٩٧٣+) – فاكس : ١٧٦٨٠١٦٨ (٩٧٣+) – ص . ب : ٤٣ – المنامة
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UNIVERSITY OF EXETER

PLEASE READ CAREFULLY BEFORE COMPLETING

SUBMISSION FORM

FORM OF APPLICATION FOR EXAMINATION OF A THESIS/DISSERTATION FOR DEGREES IN THE FACULTY OF GRADUATE RESEARCH

PART A - To be completed in FULL by the Candidate (please use BLACK INK or TYPE)

1 I, Eman Ebrahim Al Dosary (Name ***in full***),
Student Number 580045141 submit myself for examination for the
Degree of Doctor of Education in TESOL *Degree of Doctor of Education in TESOL*
in the College of Education
Title of thesis/Dissertation . Teaching with the interactive whiteboard—How to enhance teaching vocabulary to primary children aged 8 and 9

2 Date of initial registration for the degree 2008

3 I enclose 2 paper copies of the thesis/dissertation for examination (one for each External and Internal Examiner).

4 I confirm they are in a form prescribed in the University's Statement of Procedures: Presentation of Theses/Dissertations for Degrees in the Faculty of Graduate Research and embody the results of research on which my candidature for the degree is based. (If sent by post, the copies should be sent by Registered Post or Recorded Delivery).

5 I confirm I have read the Handbook for Examination of Postgraduate Research programmes

6 I confirm I have read the Statement of Procedures: Periods of Registration and Changes to Registration Status for Graduate Research Students

7 I certify that the thesis/dissertation submitted does not include any material for which a degree has previously been conferred upon me and that I have identified any work which is not my own.

8 I understand that the decision on my thesis/dissertation rests with the examiners alone and that a favourable view from my supervisor(s) cannot guarantee the award of the degree for which I am being examined.

9 I understand that the award of my degree will not be conferred until I have satisfied the requirements for final submission after examination, as set out in the above *'Statement of Procedures – Presentation of Theses/Dissertations for Degrees in the Faculty of Graduate Research'*.

10 I agree that the University will regard the electronic version of my thesis, as submitted to the University's online repository ORE, as the definitive copy. Please note the University is a participating institution in the British Library's EThOS service and a copy of your ORE submission will be shared with them (subject to any existing embargoes). For further information see http://as.exeter.ac.uk/library/resources/openaccess/e-theses/

** Tick relevant boxes*

11a [ ] * It is a requirement of the project sponsor that the contents of this thesis/dissertation are not made publicly available due to commercial sensitivities. The External Examiner will be sent a **confidentiality agreement** form to sign from the Postgraduate Administration Office.

11b [✓] * I wish to place an embargo on my thesis to be made universally accessible via ORE, the online institutional repository, for a standard period of 18 months because I wish to publish papers using material that is substantially drawn from my thesis. (NB: This option is only available if submitting electronically and will take effect from the date the thesis is uploaded to ORE)

11c [ ] * I wish to place an extended embargo on my thesis and withhold consent for my thesis to be publicly available on ORE or to the British Library until _____(maximum 5 years initially) for the following reason(s) **#:** _____

 # A letter from your supervisor supporting the embargo must be attached.

N.B: see Q13 in the FAQs at http://as.exeter.ac.uk/library/resources/openaccess/e-theses/faqs/.
Unless an embargo is requested your thesis on ORE will have universal online accessibility.

An extended embargo may be required if your thesis contains any of the following:

- *unprotected intellectual property which you, your sponsor or any other 3rd party has the intention to use*
- *sensitive information that may need to be withheld from public view*
- *commercially sensitive material that may belong to your project sponsor*

Please contact pgadmin@exeter.ac.uk if you require any further advice.

Attendance of the Supervisor at the Viva

12 [ ] I would like to invite the following Supervisor to be in attendance at my viva voce exam:

Name of nominated Supervisor: _____Dr Durrant_____

Note: Only one member of the supervisory team may attend the viva and this should normally be the 1st (lead) supervisor. They will be present as an observer only. Please refer to the Handbook for Examination of Postgraduate Research Programmes for the full regulations governing the attendance of a Supervisor at a viva.

Please also note that it may not always be possible for your supervisor to attend your viva.

To be completed in full by the Candidate:

*** **Please go to 'My Exeter' and check that both your home and contact address details are up-to-date. If not, please amend.***

Name in full (print) Eman Ebrahim Al Dosary

Signature _____ Date 29/06/2017

Contact Address ** House 568, Road 5218, Block 552, Budaya, Kingdom of Bahrain

P.O.Box 31103, Budaya, Kingdom of Bahrain

University email address: ea264@exeter.ac.uk

Personal email address ** e.aldosseri@gmail.com

GRADUATE SCHOOL OF EDUCATION

Appendix 7 Parent's letter approval

Dear Sir/ Madam

I am the researcher Eman Ibrahim Al Dosary. I am writing for you this letter to get your approval for your child to participate in my study which will be researching the effects of Interactive whiteboard use on the children's learning new vocabulary in English and their attitude towards the use of interactive whiteboard in learning.

This research will be conducted through a questionnaire and a short test in which the children will have to take in their own classrooms and with the presence of their own teacher. I would like to assure you that the identity of the children and the results of the short test and the questionnaire will be confidential and will be kept with the researcher in a safe place. The test will be testing the children on vocabulary they already studied and the results of the test will ONLY be used for the study and nothing else.

I hope that you grant me your approval by signing down. Thank you

Eman Al Dosary

(YES)I agree to let my child participate (No)I do not agree to let my child participate

Signature: Signature:

GRADUATE SCHOOL OF EDUCATION

بسم الله الرحمن الرحيم

الي حضرة ولي امر الطالب ، بعد التحيه وبعد

انا الباحث ايمان ابراهيم الدوسري ارسل رسالتي هذه لأخذ موافقتكم بأشراك طفلكم في دراسه انا اقوم بتحضيرها لأخذ درجة الدكتوراه من جامعة اكستر با المملكه المتحده. البحث الذي انا اقوم بدراسته هو آثار السبوره الذكيه في تدريس الكلمات الجديدة لطلبة المرحله الأبتدائيه الصف الخامس حيث سيطلب من طفلكم اكمال استبيان و الأشتراك في حل امتحان بسيط يمتحن معرفتهم للكلمات الجديده التي سبق لهم دراستها.

علماً بأن نتائج الاستبيان والأمتحان ستكون سريه ولن يقوم الباحث بكشف هوية اي طالب في البحث.كما ان نتائج الأمتحان ستكون فقط للدراسه ولن تستعمل لأي غرض آخر.

اتمني من حضرتكم الموافقه وتوقيع الرساله با لأسفل.

وشكراً

ألباحث

أيمان الدوسري

أوافق علي اشراك ابني/بنتي في الدراسه

التوقيع:

لااوافق علي اشراك ابني/ابنتي في الدراسه

التوقيع: